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Learning through work experience for the knowledge economy

Issues for educational research and policy

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The **European Centre for the Development of Vocational Training** (Cedefop) is the European Union's reference centre for vocational education and training. We provide information on and analyses of vocational education and training systems, policies, research and practice. Cedefop was established in 1975 by Council Regulation (EEC) No 337/75.

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Executive summary

This book identifies the achievements and limitations of successive European policy reforms and addresses future challenges in relation to work experience. It describes a new analytical tool – a typology – for conceptualising different models of work experience ([1]) in terms of learning, rather than the traditional approach of treating work experience as a social institution and concentrating upon the management of the social partnership arrangements which support its delivery. The new typology of learning through work experience places the question of what is learnt, how it is learnt and how it is used at the centre of research and policy discourse in vocational and general education (and also by extension in the wider domain of lifelong learning).

One of the differences between this book and others on theory, policy and practice in vocational and general education is that it acknowledges that, while the 'macro-systemic' approach to innovation in education and training systems is geared to offer immediate solutions to the problems of 'flexibility' or 'social exclusion', its weakness is that this approach focuses mainly on structural and institutional reorientation. This often results in a gap between introducing short-term solutions and addressing complex matters. The apparent solutions deflect attention from the underlying question of how people learn through work experience.

The book argues that, if work experience is to contribute to preparing individuals for the future, this can only happen if a shift takes place from viewing the primary purpose of work experience as a form of socialisation to that of connecting different modes of learning. In doing so, it identifies a new challenge for researchers, policymakers and practitioners: ways have to be found to present learners with opportunities to engage through work experience with the 'traditions' and 'possibilities' of practice. The book explains that this will continue to present real difficulties while the policy debate remains isolated from the debate about pedagogy and how people learn.

([1]) 'Work experience' means the use of the workplace in a way which supports learners in connecting different types of knowledge, skill and experience. The authors' definition, therefore, covers apprenticeship as well as 'school-based' programmes. It is not assumed that simply having an 'experience' of work provides the support for learners which is necessary.

An introductory chapter presents a summary of a typology of learning through work experience by showing how various models of work experience in general and vocational education embody changing European responses to policy as well as to the learner, to skill needs and sometimes to pedagogy. It introduces and explains the meaning of the term 'connectivity', which lies at the heart of a new model of work experience for the knowledge economy. Subsequent chapters cover the following issues:

(a) a summary of the European policy context, showing that reforms of work experience from the late 1980s to mid 1990s do not address the questions raised about the developing European knowledge economy;

(b) a reconceptualisation of skill in the European knowledge economy, distinguishing between conceptions of skill and contexts of skill use;

(c) an exploration of learning theory which puts forward a broader meaning of the connective model of learning through the identification of four distinctive practices in learning through work experience;

(d) illustrations of connectivity drawn from innovations in Denmark, Germany, Sweden and the UK are presented;

(e) an exploration of the implications of the typology for the development of new forms of knowledge and skill that lie at the heart of the knowledge economy debate. The question of quality is also addressed.

The implications of this book for policy development, for pedagogy and for practice are far-reaching. The focus on learning raises new issues for the research, policy and practitioner communities: it challenges them to address explicitly the ways in which work experience can assist individuals to connect theoretical and practical learning and it acknowledges that the emerging debate about knowledge management in European policy arenas calls into question the idea of transfer of best practice. This is an issue which will assume even greater significance with the enlargement of the EU and the likely interest from accession countries in learning from emerging best practice. The book demonstrates the relevance of the typology of work experience to researchers, policymakers and practitioners in both existing and new EU Member States and should be of assistance in analysing the shifts which have already occurred in work experience and what might be the direction and priorities for future change.

Preface

One of the issues constantly recurring in European educational policy discussions over the past 20 years has been the need to create closer links between school-life and working-life. All European countries have attempted to come up with curriculum innovation projects to bridge the gap between these two worlds. Many countries have introduced work experience projects for students in second level education to enable them to make a smooth transition from formal education to work or have attempted to boost the work-based elements of apprenticeship. One of the main aims of work experience projects has been to assist students make links between school-based theoretical learning and the 'experiential learning' than characterises the practice of work.

Based on a review of work experience initiatives in Europe, this book puts forward the view that many of these have not had a great deal of impact. One of the reasons put forward for this is that policy makers, both from the world of education and the world of work, have difficulty in understanding the relationship between the different kinds of learning taking place in these two worlds. In many cases this leads to one form of learning being undervalued in relation to the other in a rather crude manner. For example, while on the one hand, some policy makers associated with the world of work, dismiss theoretical knowledge as being of little use, on the other hand, some educationalists downplay the value of any learning taking place in industry as little more than a form of social conditioning lacking any educational benefits for individuals. While these perspectives may be a little extreme, it still remains true that there are interminable unresolved debates about the respective merits of the learning that people undertake in school and at work.

One of the main reasons put forward in this book for the rupture between these different kinds of learning is the lack of an engagement with how people learn – in particular with theories of learning. Such an engagement should assist us in establishing links between different types of learning and not just juxtapose them in a simplistic manner. Those researchers who are exploring holistic notions of learning, working closely with policy makers and practitioners, have a major role to play in elucidating how the different forms of learning are linked to, and indeed complement each other. In exploring the issue of 'learning from work experience, the authors of this book put forward the notion of 'connective learning'. In doing so, they draw both on their own

European research practice in vocational education and training and also on the insights of classical learning theorists, such as Vygotsky and more recently Engeström, who depict learning as an interactive process which involves mediation between different kinds of learning and different sources of learning.

This book, which draws on and further develops research undertaken in the context of the EU Research Framework Programme, explores a range of theoretical concepts that help us to make sense of 'learning through work experience'. It does so against the backdrop of a review of current policies and practices in different European Member States. The main value of this book, which has been carried out in the framework of the Cedefop research arena (Cedra) is to provide material for debate between researchers, policy makers and practitioners with the view to improving the ways in which young people learn through work experience and thus facilitate boundary crossing between the world of school and the world of work.

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Foreword and acknowledgements by the authors

The origins of this book lie in research undertaken as part of an EU Fourth Framework Programme (Targeted Socio Economic Research – TSER) project which explored the question of work experience as an education and training strategy (Griffiths et al., 2001). This research took shape in the context of the developing knowledge economy and the changes arising from the twin challenges of globalisation and regionalisation. Drawing on, building on and further developing that work, this book discusses how learning in work-related environments carries the potential to equip students with the habits of enquiry and ability to make the connections they will need and benefit from, both intellectually and emotionally, in the working environment of the 21st century. The idea of a connective model of learning has generated considerable interest for its potential to approach learning in and between different contexts.

Conscious that the development of this idea might provide a valuable research resource for researchers, policy makers and practitioners in the related fields of adult education, educational studies, human resource development and vocational education and training, Cedefop provided a grant to allow us to reflect on and further develop previous research in carrying out a project as part of the Cedefop research arena (Cedra). Appreciation is expressed to Barry Nyhan and Pekka Kämäräinen of Cedefop, with whom productive discussions were held during the course of this work. The contribution of Graham Attwell of Knownet and Pontydysgu is particularly acknowledged, as is the assistance of Leif Bloch Rasmussen, Christer Wallentin, Anne McGee and Kathy Oliver.

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Reference

Griffiths, T., Benke, M., Guile, D., Madsen, T., Marhuenda, F, Mckenna, P., Rasmussen, L.B. Work experience as an education and training strategy: new approaches for the 21st century. Final report of an EU Fourth Framework (Targeted socio-economic research) project to the European Commission, 2001.

Overview – rethinking the relation between work experience and learning

1.1. The purpose of this book

This book examines the achievements and limitations of successive European policy reforms in relation to work experience and addresses future challenges. It describes a new analytical tool – a typology – for conceptualising different models of work experience ([2]) in terms of learning, rather than the traditional approach of treating work experience as a social institution, concentrating on management and social partnership arrangements to support its delivery. The implications for policy development, for pedagogy and for practice are numerous. First, the focus on learning means that researchers, policymakers and practitioners have to address explicitly the ways in which work experience can assist individuals to connect theoretical and practical learning – as opposed to giving them experiences of different types of learning. Second, the focus on learning calls into question the idea of transfer of best practice which has informed EU and national policy for some time: it suggests that transfer is an approach which is oversimplified and mechanistic and that new thinking is needed. The debate about knowledge management in European policy arenas itself reflects a growing recognition that the idea of transfer should be reconceptualised, with attention given to meaning.

Terms which are crucial to the approaches and issues set out in this book – context, mediation, connectivity, negotiation, boundary crossing – mean different things within the various disciplines, roles and perspectives of the relevant communities. It is, for example, possible to miss the fundamentally different approach to learning which informs the connective model of learning (see Section 1.4) by assuming that its function is simply to improve the connectedness between those involved in work related learning –

([2]) By work experience, we mean the use of the workplace in a way which supports learners in connecting different types of knowledge, skill and experience. Therefore, our definition covers apprenticeship as well as school-based systems. We do not assume that simply having an experience of work provides the necessary support for learners.

educators, schools and enterprises (Kristensen, 2001). That it requires a serious rethinking of pedagogy in all contexts of learning, going well beyond strategies for improvement or the extension of the culture of quality compliance, should become evident. The connective model of learning by no means answers all the questions it raises, but it does explore their implications and connections with other research in a way that is intended to make this book a resource for the European research area (EERJ, 2003).

Using the new typology as an analytical tool, we attempt to rethink the purpose of work experience in vocational and general education and to identify the practices which facilitate learning through work experience. The book is neither a manual, handbook nor toolkit but an engagement with the principle of mutual learning between researchers, policymakers and practitioners in the field. It explores the potential of the new typology of learning and places the question of learning at the centre of the research and policy discourse in vocational education and training (and also by extension in the wider domain of lifelong learning). The typology should be useful to researchers, policymakers and practitioners in both existing and new EU member states in analysing the shifts which have already occurred in work experience and what might be the direction and priorities for future change.

The present chapter provides an introduction to the book and describes the typology of learning through work experience. The next chapter summarises the European policy context and our analysis shows that the reforms of work experience from the late 1980s to mid 1990s inadequately address the developing European knowledge economy because they have failed to pay attention to the need for new models of learning.

The third chapter addresses the question of work experience in the European knowledge economy, with its need for more highly qualified people and for individuals to be able to use their learning in different and creative ways. Conceptions of skill and contexts of skill-use should be distinguished and we present a typology of skill to illustrate how a connective model of learning, can help to achieve this.

The fourth chapter identifies four distinctive practices for learning through work experience. It explores learning theory and the broader meaning of the connective model of learning. Chapter five illustrates how the potential of the connective model may begin to be realised through innovation taking place at both system and local levels across Europe. Chapter six explores the implications of such innovations and the question of quality.

Overall, the book aims to present a new way of thinking about learning rather than rehearsing a series of good practice measures which neglect underlying problems and questions.

1.2. Approaches to work experience

The models of work experience outlined in Section 1.4 enable us to analyse what successive reforms across Europe have achieved, embodying changing European responses to policy as well as to the learner, to skill needs and sometimes to pedagogy. Before presenting the typology in detail, it is worth rehearsing the characteristics of approaches to work experience in Europe.

One model of work experience is concerned with 'launching' learners into the world of work. This model reflects the traditional aim of apprenticeship based work experience programmes of moulding and adapting students' skills in the workplace (Vickers, 1995; Stern and Wagner, 1999a, 1999b). It also reflects the tendency in school based work experience schemes (introduced in many systems in the 1980s) to assume that learners automatically assimilate workplace knowledge, skills and attitudes and internalise the implications of changes occurring in the workplace (Watts, 1983). This emphasis assumes that knowledge and skills can be taught quite separately from the context of their use.

These assumptions are consistent with a 'launch' (Kindermann and Skinner, 1992) perspective on the relationship between people and their environment in which the earlier learning determines the trajectory of later learning, with the workplace environmental influence being fairly minimal. The prime purpose of such models has been to launch learners into the world of work. However, this leaves little incentive to analyse how students learn and develop through work experience (McNamara, 1991; Granville, 1999). The result has been to maintain the divisions between formal and informal learning and academic and vocational education (Lasonen and Young, 1998) as well as the divisions between the different types of knowledge acquired in a school and in the workplace (Bjørnåvold, 2000).

A view expressed in many American and European approaches is that all stages and phases of education should be made relevant to learners and that there should be a more problem based approach to education and greater use of enquiry-based models of teaching and learning (Prawat, 1993). This approach can be described as experiential: work experience as co development. It has taken different forms in vocational education and general education.

The introduction of enquiry based learning in some European apprenticeship systems in the early 1990s reflected a recognition that the development of skilful practice required more than the simple repetition of tasks. Consequently, there was a move to support 'novices' in observing work critically and reflecting on their observations. In school based systems, this approach has resulted in the development of models of work experience based on

experiential learning. Kolb's (1984) idea of the experiential learning cycle has provided a useful framework for understanding how individuals learn through work experience (Jamieson et al., 1988; Miller et al., 1991). One consequence of this slightly broader perspective was that it placed a student's interpersonal and social development at the forefront of the agenda for work experience (Miller et al., 1991; Stern and Wagner, 1999b; Wellington, 1993). These attempts to take more explicit account of a student's development have led to greater dialogue and cooperation between education and workplaces, reflecting Kindermann and Skinner's notion (1992) of co development between interested parties. This idea led to greater interest in the need for educational institutions or intermediary agencies, such as education business partnerships, to negotiate clear objectives for learners, workplaces and schools in advance of work experience (Griffiths et al., 1992; Miller et al., 1991). Another effect was the development of new pedagogic practices to assist learners in identifying, possibly through the use of debriefing, the influence of work experience on personal and social development (Watts, 1991). However, the curriculum in general education in most EU countries was left broadly unaffected, with work experience effectively separated from the mainstream. Moreover, where experiential learning was used to support learning at work in apprenticeship based systems, the whole question of the relationship between theoretical study and work experience, even in countries with strong apprenticeship systems, was also unresolved (Griffiths and Guile, 1999).

This model was the incubus for a generic approach, which saw work experience also as an opportunity for skill assessment. One of the main educational debates in Europe in the late 1980s and early 1990s concerned promoting a greater sense of learner autonomy and self discipline, particularly in low attaining learners (Green et al., 1999). These developments led, in the UK in particular and, to a lesser extent, in other European countries, to the emergence of a generic perspective on learning. This perspective suggests that a more liberalising and egalitarian system which attaches prime importance to the outcome, and does not prescribe the learning necessary to gain a qualification (Jessup, 1990). It also reflects the idea that an agreed series of common outcomes can be identified for any programme of study and that it is possible to assess the learning that has occurred in the form of a key qualification (Kämäräinen and Streumer, 1998). Despite being subject to considerable criticism about their behaviouristic (Ecclestone, 1998) and mechanistic (Jones and Moore, 1995) assumptions, learning outcomes have gradually become a feature of many work experience programmes.

Work experience in apprenticeship has resulted in some European countries in the introduction of competence profiles assessed in the

workplace. The emphasis on learner centredness and autonomy in school based systems, has been interpreted as planning a work experience placement and managing and evaluating learning through the use of statements about learning outcomes in a personal action plan (Miller, 1996; Oates and Fettes, 1997). The plan serves as a 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. The idea of teacher/trainer facilitated reflection, however, is more problematic than is generally recognised (Usher et al., 1997) and rests upon the assumption that experiential learning is a natural category, with the 'voice' of an individual or community constituting authentic knowledge of a situation. Ideas of experiential learning and voice discourses are endowed with theoretical assumptions (Moore and Muller, 1999) and the meaning and significance of experience depend not only on the experience as such but also on how, and by whom, it is interpreted (Brah and Hoy, 1989).

By underestimating the need to explore with learners the extent to which experience is constrained by its context, the generic model of learning has neglected the fact that learners have to be immersed in ideas as well as in the world of experience: using a theoretical concept in a practical situation involves resituating it in a form which fits the context (Guile and Young, forthcoming). This is not necessarily a process of logical reasoning but of 'mulling over' the situation until 'something seems to fit' (Eraut, 1999). It relies on mediation, the process being carefully managed to ensure that learners develop the basis for connecting their context specific learning with ideas or practices from outside those contexts.

These models of work experience – traditional, experiential and generic – are clearly recognisable. They are traced within and between the relationship of general and vocational education in Europe, as described in studies of recent years. Kämäräinen (1997), for example, charts the different approaches to the problem of 'parity of esteem' as 'educationalist', 'professionalist' and 'pluri systemic'. Young and Raffe (1998) describe strategies to promote parity of esteem as 'vocational enhancement', 'mutual enrichment', 'linkages' and 'unification'. Attempts to strengthen work experience have been made in both general and vocational education, notably in increasing access, lengthening the period and using work experience to combat social exclusion. Cedefop (1998) describes a further attempt to reform general and vocational education, raising the profile of work experience in the process, through the medium of key qualifications (Kämäräinen et al., 2002b).

Several European countries have attempted to reform the traditional model of work experience. One approach has been to concentrate on

strengthening the social partnership and management arrangements underpinning work experience. Another has been to introduce broader learning experiences to support the employability of learners in the rapidly changing European labour market and to respond to pressures created by changing forms of production, the introduction of new technologies and the demand for higher levels of skills and knowledge. However, despite evolving the traditional model of work experience, there remains a tendency to view work experience primarily as a form of socialisation into a given occupational culture and organisational context. Models of work experience have generally attempted to address new issues about skill development while neglecting the need for new models of learning in the workplace. They have usually been geared to quite traditional conceptions of work and work roles and have been based on fairly mechanistic conceptions of learning. They fail to support learners in developing future oriented capabilities.

While policy studies reveal a considerable extension of work experience in general education and a continuation of apprenticeship, they also point to continuing debate and, at times, ambiguity and tension in the purpose and intent underpinning the concern with work experience. Almost every country has some history of work experience through apprenticeship systems and within general education. The extent of historical practice is largely dependent on the relative size and importance of the apprenticeship system and what emerges from the policy discourse and its associated measures is a recognition that work experience has a part to play in supporting young people's employability. However, there is an *ipso facto* assumption that employability and/or skill acquisition can be enhanced simply through having an experience of work. The implicit assumption is that experiences equate with understanding. This relates to the consistent finding of research (e.g. Griffiths et al., 2001) that the conceptualisation of both problems and solutions differs markedly between policy makers and researchers; so, in the policy domain, learning questions give way repeatedly to accreditation issues or management questions. This means that solutions tend to be rigid and do not address the difficult question of how people learn in general and vocational education through work experience.

A new model is needed, premised on a different set of assumptions. If work experience is to support learners in making the transition into work and between different contexts and activities in work, it is vital to understand how the context of work is changing – the context not simply of geographical location or industrial sector but the social, cultural, organisational and technological character of the context of work which is responsible for 'shaping' (Heidegger, 1997) the work practices in which learners are expected to participate.

In doing this, we have drawn upon literature from sociology (e.g. Castells, 1996; Stehr, 1994), management (e.g. Drucker, 1993; Nonaka and Takeuchi, 1995) and innovation systems (Lundvall and Bórras, 1997) which have attempted to theorise the new economic and technological conditions for shaping the knowledge economy. One of the dominant characteristics of this new context is that it is simultaneously shaped by the contribution which theoretical knowledge (e.g. from science and technology) and everyday knowledge (e.g. individual/collective knowledge about work practice) can make to support innovation in product and service delivery.

In developing this analysis, we clarify a problem in the European knowledge economy which policy makers increasingly expect to be addressed by work experience: how educators can support young people to develop generic skills in context specific situations. A classic example is that of solving problems in the workplace: in offering accreditation for prior or experiential learning (Bjørnåvold, 2000) or in using 'learning outcomes' as a 'proxy' measure for skill development (Green et al., 1999), it is assumed that this constitutes evidence of learners' having developed the skill of problem solving. However, solving problems is closely connected to identifying and defining problems in specific work contexts and at specific levels of complexity in those contexts. Problem solving must therefore involve a combination of theoretical knowledge and practical experience.

Issues like these illuminate the gap between the introduction of short term measures and addressing complex matters. The main goal of policy is still to offer immediate solutions to the problem of flexibility or social exclusion. This is admirable but the apparent solutions deflect attention from the underlying question of how people learn through work experience. Policy makers periodically recognise that work experience should contribute to preparation for the future. However, this can only happen by moving from viewing the primary purpose of work experience as socialisation to viewing it as connecting different modes of learning. If work experience continues to be merely the immersion of learners in existing social practices, they may simply develop an attachment to a set of unreflected social practices. This means that they are unlikely to identify any qualitative differences between the knowledge and practices associated with different levels of activity undertaken within specific communities of practice. If work experience is to lay the foundations for lifelong learning, educators must find ways of presenting learners with opportunities to engage with the traditions and possibilities of social practice. This will continue to present real difficulties while the policy debate remains isolated from the debate about pedagogy and how people learn.

1.3. New approaches to learning and the knowledge economy

The relationship between theoretical and practical experience and the development of knowledge and skill lies at the heart of the knowledge economy debate. Development of the European knowledge economy will, in part, depend upon overcoming those contradictions in the workplace which stifle creativity and collaboration, and which in vocational and general education assume that learning can be equated with simply having an experience of work.

Work experience should not simply consist of participation in existing social practice; if learners are to understand the limitations of practice, they require opportunities to resituate their theoretical and practical knowledge and skill in new contexts in order to create new knowledge and practices. A new approach to work experience must address the kind of support needed to develop the intellectual basis for this. Learners need opportunities to model and, wherever possible, implement solutions, although this process can only occur in a context where educational institutions and workplaces have developed a shared understanding about their respective roles in assisting learners to develop as boundary crossers. A pressing question is how learners can be supported in resituating knowledge and skill in different contexts. This is crucial in formulating a theoretical understanding of the world of work and can also provide learners with opportunities to identify contradictions and model solutions, even if they cannot actually implement them.

Another prerequisite of the knowledge economy is that learners develop the confidence to cross organisational boundaries or the boundaries between different, and often distributed, communities of practice. They must connect their knowledge to that of other specialists, whether in educational institutions, workplaces or the wider community.

One response to the division between theoretical and practical learning emerged initially from within German VET tradition and has become a feature of VET in other EU countries (Boreham and Fischer, 2002). The concept of work process knowledge – understanding the labour process in terms of product related, labour organisational, social ecological and systems related dimensions – has been introduced to assist apprentices and teachers in overcoming the dilemma of inert knowledge, that is, knowledge which has been taught but is not immediately useful for practice (Kruse, 1996). When in 1985 Wilfried Kruse first introduced the term, *Arbeitsprozesswissen* (later redefined in English from 'labour process knowledge' to 'work process knowledge'), he was pointing to the kind of knowledge owned by

experienced workers. This, he suggested, offered an insight into changing working practices in different industries – computerisation as well as new occupational profiles had become important matters of discussion. Recognising this, overcame the tendency to assume that the primary objective of apprenticeship was to assist people to adapt to narrow occupational profiles created in a Taylorist tradition. Kruse postulated instead that the knowledge required – now and even more so in the future – will not only refer to isolated atoms of work behaviour but to the work process as a whole. It will combine theoretical and practical knowledge (Fischer, 2001).

The main distinguishing feature of the work process knowledge approach is that it draws attention to the 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 (Fischer and Stuber, 1998). The prime purpose of work experience, from this perspective, is to help apprentices attune themselves more successfully to the changing context of work through participation 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 affected by their development (Kindermann and Skinner, 1992).

Work experience by itself will not promote work process knowledge. It needs to be mediated, perhaps by the introduction of concepts, perhaps by subject knowledge, and the process of mediation may take place within the workplace and company training centres (Attwell and Jennes, 1996). This recognition has led to attempts to develop German VET programmes further to help learners connect theoretical and practical learning more explicitly (see Chapter 5); aspects of connectivity are being explored in this context.

An approach to work experience based on a connective model of learning is discernible at local, if not system, level in some European countries. This model embodies a reflexive conception of learning based upon the principle of mediation (Guile, 2001). It involves taking greater account of the influence of the context (i.e. the organisation of curricula and work) upon student learning, the extent to which learners have opportunities to participate in the range of practices (i.e. dialogic enquiry, boundary crossing, resituation) that support learning through work experience and how far the work experience supports learners to mediate between theoretical and everyday knowledge to create new knowledge and new practices.

The term 'connectivity' defines the purpose of the pedagogic approach required to take explicit account of this view of learning. Supporting learners

to mediate between theoretical and everyday dimensions of learning and development constitutes a pedagogic challenge for educators in schools and workplaces. It involves encouraging learners to appreciate that their relationship to the world is mediated as much through symbolic systems and the design of work as through material tools such as computers. One way of grasping the implications of this is to understand workplaces as a series of 'interconnected activity systems' (Engeström, 2001) consisting of a range of 'communities of practice' (Lave and Wenger, 1991; Wenger, 1998) and 'distributed resources' (Hutchins, 1995) which can be used to help learners to mediate their relationship with education and work. Supporting learners to come to terms with this interpreted world involves providing opportunities for them to acquire the four practices of learning described in Chapter 4. These assist learners to grasp existing traditions while providing them with opportunities to explore the possibilities of practice. Learners, educators and workplaces need to ensure that work experience provides an opportunity for learners to learn to negotiate how they learn in workplaces.

Learners also need to learn how to draw on their theoretical knowledge, to interrogate workplace practices, and on their everyday knowledge, to interrogate theory. Without this iterative process of interrogation, it will be difficult for learners, in schools or enterprises, to identify the possibilities of practice and envision and implement new ways to organise work, education and work experience. Such ideas about learning through work experience imply a reappraisal of human resource development strategies, as well as management and development practices, by host organisations and of pedagogic practice by teachers, since learners and workers have to learn how to enter unfamiliar territory and work collaboratively in different communities of practice.

One of the most significant implications of this reconceptualisation of work experience is in the transfer of learning. Instead of viewing transfer as a matter of reapplying knowledge and skill acquired in one context (a workplace) to another workplace, it becomes more helpful to view transfer as a process of boundary crossing involving consequential transition. This process reflects the recognition that learners are likely to be engaged in a variety of different tasks and in different contexts and thus may come to demonstrate the type of polycontextual skills identified in Chapter 3. 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 the workplace 'zone of proximal development'.

Learning through work experience calls for the formation of new practices and new mediating concepts which assist learners in developing the social interaction that support dialogic problem solving (Guile and Griffiths, 2001). 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. 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 negotiation as part of the workplace experience.

1.4. A typology of work experience

The typology of work experience presented in Figure 1 embodies changing European responses to policy, to skill needs and to pedagogy. It conceptualises the various models of work experience in general and vocational education in relation to six dimensions which are central to a consideration of how individuals learn through work:

(a) the purpose of work experience;

(b) the assumptions about learning and development (i.e. ideas about pedagogy and learning in workplaces);

(c) the practice of work experience (i.e. types of practice which facilitate learning through work experience);

(d) the management of work experience;

(e) the role of the education and training provider (i.e. pedagogic strategies employed in general and vocational education to support students in learning);

(f) the outcome of work experience (i.e. forms of knowledge, skills or broader capabilities that students have developed).

Figure 1. **A typology of work experience**

MODEL OF WORK EXPERIENCE	Traditional Model 1	Experiential Model 2	Generic Model 3	Work Process Model 4	Connective Model 5
A. Purpose of work experience	'Bridge' to work	'Co-development' between education and work	Key skill/ competence assessment	'Attunement' to work environment	'Reflexivity'
B. Assumption about learning and development	Adaption	Adaption and self-awareness	Self-management	Adjust and transfer	Vertical and horizontal development
C. Practice of work experience	Managing tasks and instructions	Managing contributions Plus recording experiences	Managing action-plan and learning outcomes Plus managing situations	Managing work processes, relationships and customers Plus adding value for employer and supporting employability	Developing the connective practices Plus 'entrepreneurial ability'
D. Management of work experience	Supervision	Arms-length supervision	Facilitation	Coaching	Developing and resituating learning
E. Role of education and training provider	*Provide:* formal preparation programme	*Facilitate:* briefing for and de-briefing of work experience	*Build:* portfolio of achievements	*Support:* reflection-in and on-action	*Develop:* partnerships with workplaces to create environments for learning
F. Outcome of work experience	Skill acquisition Knowledge of 'work readiness'	Economic and industrial awareness	Assessed learning outcomes	System thinking	Polycontextual and connective skills

The bridge to work (socialisation model – model 1) has a role for formal learning in acquiring knowledge and skills and work-based learning of tasks. Model 2 (experiential model) attempts to develop this traditional model further in response to the need for students to acquire specific knowledge and skills and more generic knowledge and understanding about the content of work. With the growth of interest in 'key skills', there is an attempt to develop an alternative to the traditional model which emphasises the use of work-based experience to acquire and accredit learning outcomes (model 3). The work process approach (model 4) is an attempt to address the omissions of the latter two approaches and to develop further the interface between the vocational school and the workplace. Finally, there is an interest in developing a connective model of pedagogy and learning in work-based contexts (model 5). This model integrates and goes beyond the principles of reformist, alternative and dualist models and makes a fundamentally different assumption about learning and development, accepting that all forms of learning are 'situated' and involve the use of knowledge that may be external to the context.

These models of work experience are analytical rather than descriptive and have been formulated to identify the dominant assumptions about learning through work experience. The first four models reflect the influence of different economic, technological and social factors prevailing in Europe as well as different ideas expressed over the last two decades about learning and development through work experience in vocational and general education. The models reflect different periods of economic and technological development and changing educational ideas about the process of learning. However, no specific work experience programme fits neatly into any of the models and some programmes may contain elements of more than one model. Their main purpose is to reveal aspects of work experience to researchers, policymakers and practitioners which may otherwise remain obscure, perpetuating problems which need to be addressed. The fifth, connective model displays innovatory features which are relevant to future approaches to effective learning through work experience and provides a basis for different explorations. The following chapters chart these in terms of the development of the European knowledge economy and the implications for policy, practice, pedagogy and research.

Work experience: policy and practice in Europe

2.1. Introduction

This chapter describes how European policy makers have variously addressed the question of work experience as a response to the challenges and problems of economic, social and technological change from the late 1980s through the 1990s. We start by providing a summary of the macroeconomic and technological changes in the European economy and the micro changes in organisation of work. We then provide an overview of the changes in the provision and organisation of work experience across Europe, suggesting that many attempts to reform work experience have addressed new issues about skill development without paying attention to the need for new models of learning.

The criteria informing the typology of work experience described in Chapter 1 are used to indicate the shift, during the late 1980s and the 1990s, away from viewing the purpose of work experience as primarily to socialise or assist learners, through providing a bridge to work and towards serving broader educational purposes.

2.2. The implications of economic change for education and training

2.2.1. Macro-level changes in the economy

It is generally agreed at a European level that structural transformation occurred with increasing rapidity in all advanced industrial states from the late 1980s onwards (Green et al., 1999). This economic restructuring is usually attributed to the complex interrelationships and interdependencies of three key factors:

(a) the quickening pace of global, scientific and technological innovation, resulting in knowledge becoming more important to global economic development than traditional factors of production such as land, capital and labour (Drucker, 1993);

(b) the emergence of a new techno-economic paradigm which has sometimes been referred to as the 'informational mode of development' (Castells, 1996). The main features of this paradigm are the application of three new principles – value-making, relation-making and decision-making – to work organisation, work design and business-to-business interaction and the deployment of information and communication technology to monitor and provide feedback on workflow, product and process performance and sales;

(c) the global process of industrial convergence which is helping to blur the lines separating traditional industries, for example, telecommunications, from newer ones, such as media and computing, and create new growth opportunities as technologies and markets converge (Yoffe, 1996).

2.2.2. Micro-level changes in the workplace

There has also been widespread agreement that economic and technological developments have resulted in changes in the organisation of work and work roles, shifting from:

(a) a division of labour formerly based on the functional separation of, and differentiation between, areas of work (i.e. design, production, marketing, etc.) towards the integration of those areas of work (Bartlett and Ghoshal, 1993);

(b) a division of labour based on extended occupational hierarchies towards one based on 'flattened hierarchies';

(c) the design of work roles based on the principle of task-focused activity towards work roles based on the principle of the management of work processes, customer relationships, etc. (Guile and Fonda, 1999).

2.2.3. Implications of macro and micro change

The macro and micro changes, even though they may vary according to national and regional circumstances, have been widely interpreted by policy makers as requiring higher levels and broader forms of knowledge and skill among young people. These can be summarised as a demand for:

(a) higher levels of formal academic or technical knowledge (Green et al., 1999);

(b) greater evidence of generic skill development – practical skills which are seen as essential to flexible performance in the workplace and in supporting employability – in the form of the growing demand for key qualifications or transferable or transversal skills (Kämäräinen et al., 2002b)

The cumulative effects of these developments through the 1990s led EU policy makers to stress the need for closer links between education and the world of work to enable learners to broaden the basis of their skill development and, it is argued, their future employability (Green et al., 1999). Policy makers continually affirmed the important role of education-business partnerships as a strategy for fostering such links, albeit without placing as much attention on the content of such partnerships. Attention focused on the role of work experience in both general and vocational education and training as one type of education-business partnership activity to be undertaken (Griffiths et al., 2001). This is partly because work experience has been seen as potentially offering an appropriate and rich environment for the acquisition of these types of knowledge and offering opportunities for linking the acquisition of more formal occupational and technical knowledge to its application in work.

2.2.4. Background to changes in work experience policy and practice

This chapter partly reflects the wish of policy makers to recognise that work experience offers different opportunities to assist learners in broadening the basis of their skill development and employability in both the educational and work spheres. We show how work experience during the 1990s was increasingly expected to serve a broader set of purposes, for example, assisting learners to attune to the changing demands of work roles and offering an opportunity to gain some accreditation/recognition for the skills developed in the workplace.

This chapter draws on a number of policy studies (Griffiths et al., 2001; Attwell, 2000) on the link between work experience and employability. These studies involved literature and document searches and a series of semistructured interviews with researchers and policy makers from the Member States, together with Hungary. The chapter does not summarise that detailed work but rather draws out the ways in which policy makers have reacted to change. Distinctions between these responses are made by highlighting the broad trends evident in those countries which have strong apprenticeship-based systems and those which have strong school-based systems (where work experience is an integral part of education and training).

The studies revealed considerable similarities in policy intent and strategy in the changing purposes and uses of work experience. At the same time, they showed great diversity in the ways in which policies were being implemented. This apparent paradox may be explained by different historical, economic, social and cultural dynamics in the different countries (Attwell and Hughes, forthcoming). While the educational assumptions about the link between work

experience and employability are converging, the contexts and environments in which work experience is being developed and implemented, and its relationship with other broader societal policy and practice, are quite divergent across European countries. Of particular importance is the changing structure and character of labour markets and the relationship between the opportunities these labour markets afford for work experience.

A second paradox was revealed by the studies. In those countries where work experience plays a central part in school-to-work transition – notably the dual system countries of Germany and Austria – there is little focus on informal learning in work as an educational goal (Bjørnåvold, 2000). Similarly, the countries with strongest initial systems of vocational education and training have been slower to embrace the values and practice of lifelong learning. Paradoxically, in countries such as Greece, Italy and Portugal, the relative weakness of formal vocational education and training has resulted in non-formal learning through work experience taking on extra importance as a means of competence reproduction and renewal.

2.3. Changes in work experience

2.3.1. Introduction

One of the most notable developments is the considerable extension of work experience across different levels and subjects in general education to sectors of the community presently excluded socially. This has been accompanied by a significant rethinking of work experience in apprenticeship-based systems. What emerges is a continuing concern to explore how work experience in general and vocational education can play a part in some way in supporting young people's employability. At the same time, it is evident that there is a continuing debate and, at times, ambiguity and tension in the purpose and intent underpinning the growth of work experience. This is partly because there has been a tendency to develop the potential of work experience through a series of reforms and measures based on previous assumptions about learning through work experience, rather than engaging in any systematic discussion of the relationship between learning in formal settings and learning in the workplace. This oversight about what is meant by learning is explored in greater detail in the next two chapters.

2.3.2. Overview of general trends

Almost every European country has a long history of work experience through apprenticeship systems and many countries also have a shorter

history of work experience in general education. It is clear, however, that similar demands have been placed on both forms of work experience.

Work experience is at the centre of the German dual system of apprenticeship, which still accounts for over 50 % of school leavers. The major purpose of work experience is seen as providing occupational socialisation and identity through entry into a recognised community of practice (Brown, 1997). In Austria, apprenticeship is seen as having a primary role in social and occupational integration and in the formation of occupational identity, rather than as an education and training strategy (Mayer et al., 1999). However, economic change and changes in technology and work organisation have resulted in pressures for higher levels of competence and knowledge in the workforce as well as for the acquisition of key qualifications, such as learning to learn and working in teams. Work experience is being challenged to take on an educational purpose. One perspective from the Flemish Ministry of Education sees work experience as having two goals: to gain experience of the environment of the workplace and to 'see real life' and to acquire basic vocational competences (Attwell, 2000).

Movements towards competence development and the emergence of new forms of competence assessment are leading to a renewal in work experience in vocational education as an educational strategy and tool. The wording of the Vocational Education Act of 1998 in Finland is particularly interesting in this respect. The Act, which stipulates that all study fields should include a period of at least six months' workplace learning, emphasises the learning component of work experience. Trainees are called 'workplace learners' and the work is called 'work-based learning'. One perspective (Lasonen in Attwell, 2000) sees the importance of this distinction as follows: 'The traditional words, "work practice", have been considered inappropriate when revising curricula to achieve a better fit with working life and replaced with the concept of work-based learning. This reflects a wish to distinguish between acquiring experience and gaining experience.'

This change in the purpose of work experience is not unproblematic. While the previous aims of apprenticeship were clear and largely understood by different social actors, the new-found educational purpose of work experience is far less so. It also calls into question social relationships, in particular, the relationship between schools and enterprises and relationships between different government departments and agencies. It raises issues of societal responsibilities and, in particular, the role of enterprises in education. While, traditionally, work experience through apprenticeship was primarily for socialisation and skills, knowledge and competences were acquired in the process of entry to an occupational community of practice. Thus the

curriculum could be relatively informal and required only light guidance. Similarly, assessment was largely informal, based on the ability to integrate socially and to perform in the workplace.

The problem of the limited extent of research into how people relate the learning gained through work experience to their general or academic education is recognised (Griffiths et al., 2001; Attwell, 2000; Mayer et al., 1999). It is noted that the limited interest among policy makers in this issue results in the failure to develop systematic strategies and policies for work experience, either at a systemic or institutional level. It has been observed in Spain (Gimenèz et al., 2000), for example, that, although there has been a development and expansion of workplace training, policy and administration have not changed. One result is an instrumental perspective of VET and work experience which means that, in the response of both theoretical and practical training to labour market demands, the emphasis on learning and personal development may be neglected or simply assumed to be an implicit feature of work experience.

A slightly different dynamic tension is evident in relation to the purposes of work experience within school-based systems. Policymakers in Sweden, a country which is widely recognised as having one of the strongest school-based systems in Europe, started to express interest as early as the mid 1980s in extending work experience into the academic pathway. A series of pilot work experience programmes was introduced in an attempt to make academic education more relevant to students by helping them to connect their studies to everyday life and the changing nature of work. The pilot programmes experimented with enquiry-based models of learning in an attempt to encourage schools to extend this approach to academic education and to overcome a reliance on transmission models (Madsén and Wallentin, 1998). After the initial rush of enthusiasm, the impetus faltered because work experience was not made a compulsory part of the academic pathway. This situation was rectified in the late 1990s when work experience was made a compulsory feature of both academic and vocational pathways, although the proportion of time allocated to work experience varied within each pathway. By making work experience a compulsory activity in upper secondary education, the Swedish Education Ministry has made a national commitment to supporting parity of esteem between academic and vocational education in an attempt to support learner employability and assist in effective transitions to working life (Madsén and Wallentin, 1998). In Ireland, the introduction of the Applied leaving certificate, which offers vocational preparation, has created an opportunity for learners in 16-18 education to participate in a work experience programme (McKenna, 1998).

2.4. Work experience: unanticipated problems

2.4.1. Introduction

In addition to the impact of the macro and microeconomic and technological changes outlined earlier, there are other factors which have helped to sustain the almost continuous processes of renewal and reform in work experience throughout the 1990s. We discuss here the reasons and impetus behind a number of those factors (shortage of places for work experience and academic drift, the slow reform of occupational profiles and the growing problems of social exclusion) before identifying how policy for work experience has responded.

2.4.2. The shortage of work experience places in apprenticeship and academic drift

One of the problems encountered in attempts to reform work experience has been the growing shortage of work experience places. This has been the case in countries traditionally characterised by strong social partnership traditions as much as in countries with weaker traditions. For example, Germany and Denmark have faced problems throughout the 1990s in maintaining and reforming their apprenticeship systems. The major challenges facing the German dual system have been outlined by Heidegger and Rauner (1996) in their report *Vocational education in need of reform*. They recognise the role of the German State in weighing general economic and social objectives against the particular interest of individual enterprises. While the increasing demands of flexible production are leading to a tendency to individualisation of perspectives and occupational identities, they advocate the strengthening of occupational identity as a key factor in social solidarity and in combating social exclusion. The present crisis in the dual system, they state, is characterised by three factors: a shortage of apprenticeship places; a drift away from the dual system to the gymnasium and academic higher education; and a need for modernisation in occupational profiles and the content and processes of vocational training. Danish researchers have identified similar pressures and concerns in relation to how work experience can evolve to support young people's employability in a knowledge economy (Herlau et al., 2000).

While economic and demographic factors have been identified as contributing to the shortage of apprenticeship places in Germany and Denmark, other long-term structural factors are also having a major impact in both countries:

(a) a dramatic decrease in the number of apprenticeship places in large enterprises due to the establishment of individual cost centres, tendencies towards outsourcing and pressures for the maximisation of short-term profits;

(b) in the craft trades, which are numerically more important in terms of apprenticeship provision, enterprises are increasingly unable to provide training and experience for the breadth of tasks and knowledge demanded of new occupational profiles;

(c) the growth of the tertiary sector of the economy has not been accompanied by a corresponding increase in apprenticeship places in service and infrastructure occupations.

There are several factors behind the drift away from apprenticeship and towards academic qualifications through the gymnasium and university. While this move is reflected in most other European countries, in Germany it takes on an increased significance precisely because of the centrality of the dual system to industry and commerce. The increasing economic uncertainty, a shorter product life cycle and the introduction of new technology has also led to more rapid change in the structures and contents of occupations. Faced with such uncertainty, young people have increasingly opted to attend university as a 'high class holding position' (Evans and Heinz, 1994). This perception about the relative additional values of academic and vocational qualifications was reinforced during this period by the actions of many employers who were able to employ graduates for jobs which previously would have been filled by vocationally trained employees (Mason, 2000). One of the dangers of this development is that the dual system may come to be seen as a route for low achievers. This potential problem is compounded by another development, namely that the greatest reduction in apprenticeships is taking place in the blue collar and high skill areas to which the most able potential apprentices aspire, leading to increasing differentiation in the attraction and outcomes of apprenticeship within the dual system.

2.4.3. **Reform of occupational profiles**

In nearly every European country in the 1990s, there was an acknowledged need to modernise the system of occupational profiles. Unfortunately, poor coordination between social partners and state authorities has resulted in considerable delay in integrating new developments within occupational profiles. Systems maintained by representative organisations were often very slow to adapt to change because many interests had to be consulted before changes could be undertaken. A particularly good example of this is provided

by the current difficulties of the German system in adapting to the needs for social skills and to an economy more oriented to services rather than manufacturing (Crouch, 1999). Longstanding occupational profiles need to be oriented towards future work and society, rather than reflecting outdated tasks and forms of work organisation. The present division of occupational profiles into over 370 separate occupations is at variance with new forms of work organisation. Furthermore, the current system fails to support new combinations of technical and commercial tasks which are becoming increasingly important in customer-oriented service and technical sectors. These issues of fundamental importance have introduced a new agenda into discussions about the future organisation of apprenticeship, suggesting that new ways of approaching learning and development must be developed.

Apart from slowing down the pace of reform of work experience, problems in securing the agreement of social partners to the reform of occupational profiles have also had an impact on regional regeneration. During the 1990s, there was widespread recognition of the need to increase the regional responsiveness of education and training, given the considerable differences in the speed and direction of economic development in different regions (EU, 1998; Cedefop, 1998). At the time, the apprenticeship systems in most countries were still based on traditional industrial divisions of labour and profiles represented traditional industrial occupations. A lack of progress in updating occupational profiles and curricula meant that the process of introducing new apprenticeship routes to reflect emerging industrial sectors and their priorities was slowed down.

Other factors contributed to undermining the process of reform during this period. The genuine concern of many enterprises that the content of curricula was not relevant to the emerging needs of industry and commerce, coupled with employers' call for higher levels of learning and understanding of theory, meant that there were many complex issues that had to be resolved. In addition, the growing number of small enterprises provided limited training opportunities and self-employed people had restricted access to training. At the same time, large industries were increasingly limiting training places to the numbers required to meet their own needs. Research suggests that while large industry sees a social and economic responsibility for training the future labour force, small and medium sized enterprises (SMEs) are more often concerned with securing cheap labour (Attwell, 2000).

2.4.4. The problem of social exclusion

The process of deindustrialisation and the rise of the service sector from the late 1980s have both had a significant impact on the transition from school

to work among large sections of indigenous and ethnic minority populations across Europe. One manifestation has been a noticeable trend for many young people to become socially excluded, with the result that they face reduced opportunities in the labour market and are at higher risk of dropping out of the social mainstream (Evans and Niemeyer, 2003).

This problem has been exacerbated by the pattern of migration into many parts of Europe and an increase in the numbers of those seeking asylum. The cumulative effect of these developments has been to increase the proportion of the population which is socially excluded. However, another effect has been to generate pressure on national governments to identify innovative ways of offering socially excluded groups opportunities to participate in education and training. In many instances, the response from policymakers at national and regional level has been to develop innovative schemes based on work experience.

Participation in the labour force has rightly been regarded by national governments as being of crucial significance in tackling social exclusion; it provides people with the income they need to participate more generally in society and gives purpose and direction to many. Yet, for some social groups, patterns of migration have made participation particularly difficult. For example, the migration of different ethnic communities in the 1960s and 1970s from the south of Europe to the north, and now back after their retirement, and recent migration movements from the eastern European countries or Africa to Europe have generated special problems for young people. These patterns of migration have created particular forms of youth unemployment in all countries from Portugal to Belgium – with only Finland being less affected (Evans and Niemeyer, 2003). The region in which young people live shapes their access to the labour market. On the one hand, where there is a strong need for unskilled work, the importance of VET is reduced – young people from migrant backgrounds tend to enter the labour market without special training. On the other hand, countries with strong vocational systems (e.g. Denmark, Germany, Spain) tend to insist that applicants for apprenticeship have acquired the requisite level of certification, while those countries with rather informal training systems (Ireland, UK) seem to be more flexible and more receptive to offering lower qualified young people access to work-based training.

2.5. The policy response to unanticipated problems

Over the last decade, work experience has been central to many of the measures devised to combat the unanticipated problems associated with renewal and reform in vocational and general education in Europe. This section identifies the range of responses and gives some indications that they may contain contradictory intentions and implications that will have to be addressed in the future.

2.5.1. Improving the transition from school to work

In a concerted effort to improve the transition from school to work and help to provide a threshold to combat social exclusion, many European counties chose to raise the school leaving age. This measure served both a social policy objective and an educational goal. With the minimum school leaving age rising to 16, 17 or even 18 years, traditional academic or vocational curricula have been seen as inappropriate and failing to meet the needs of a significant section of this age group. More work-oriented education and training, including work experience, has been seen as enhancing learning, while serving as an orientation phase for future entry into the labour market.

A particularly good example is the Netherlands where, after a lengthy debate about the desirability and consequences of providing dual (school and work-based) secondary vocational education, the dual system has been reformed to serve a number of different purposes. The first is to provide better preparation for students entering work. The second is to provide easier school-to-work transition. The third is to provide a better link between vocational education and the labour market. While these aims are linked, there has been some evolution in the debate. Earlier discussions were more focused on easing school-to-work transition through introducing work experience into the school curriculum. Latterly, discussions have centred on better preparation for work and on the acquisition of work-related competences. This evolution may be linked to the changing employment position, with skill shortages replacing youth unemployment as priorities for policy makers.

The development of learning routes based on work experience is also seen as promoting social inclusion through opening up access to learning and qualifications. At the same time, it responds to the critique that social policy has supported young people in not working. Ireland, for example, has made a determined effort to use work experience to reintegrate young people. Schemes, such as the Community employment scheme provide an opportunity for young people to choose an occupational field and to

negotiate a training plan to help them acquire practical skills and some form of basic qualification (McKenna, 2000). In the 1990s, in Finland and many other countries, funding and social benefits for young people were made dependent on participation in education. However, the adequacy of these measures in promoting employability is still to be tested beyond the undoubted enthusiasm and commitment of the social partners involved in the design and delivery of work experience programmes.

A slightly different picture of the changing role of work experience in supporting school-to-work transition emerges in countries such as Sweden and the UK, which have strong school-based systems. Part of the reason is that schools have considerable autonomy to plan and implement their own programmes of work experience. This relative autonomy can facilitate considerable innovation at local level in developing models of work experience to support learning and knowledge development. However, because these innovations are not part of a wider programme of reform, they can often remain undetected and the important issues they address may be overlooked. Another reason is that, in countries such as the UK, national policy has focused on raising educational standards. One consequence of this approach is that policymakers have neglected the contribution which work experience can make to raising standards or to supporting learners' employability (Griffiths et al., 2001).

In the light of the extended transitions to work which many young people experience and the uncertainty that frequently characterises those transitions, a further goal of many of the policy measures has been to provide better educational and occupational guidance and careers orientation. With increasing rates of change in occupations and in job contents and, at the same time, a weakening of traditional peer and family influences in the selection of future occupations, there has been a general recognition that present systems of career and occupational guidance are inadequate. Work experience is seen as allowing more reasoned and rational choices in future career orientation.

2.5.2. The enhanced role of educational institutions

One trend seen in Finland, Germany and the Netherlands in the 1990s, has been to give schools new responsibilities for regional economic development, with work experience providing a vital link between the educational role of the schools and the economic functions of learning. The promotion of work experience is seen as increasing the relevance of vocational learning and providing an impetus and focus for innovation and economic development. The extension of work experience is leading to a fundamental change in the role of schools and educational institutions.

In Finland, the Vocational Education Act of 1998 provided a new role for vocational education schools. Multidisciplinary institutions (as opposed to monodisciplinary organisations, such as forestry schools) are expected to act as economic development centres providing support for SMEs and developing a regional business strategy. This is designed to overcome the twin divides between separate occupational cultures and between occupational and vocational structures.

At the same time, the guidelines to the Act lay down new work experience roles for vocational schools (Attwell, 2000):

(a) VET providers are responsible for organising student on-the-job training;

(b) VET providers must ensure that companies have sufficient facilities and potential for learning and have staff to guide students;

(c) VET providers must train enterprise staff in colleges and run tutor programmes to ensure that staff understand training programme objectives;

(d) VET institutions must make formal agreements with enterprises, including timetables, definition of learning objectives, curriculum content and labour protection. They must also nominate workplace and institutionally based teachers to coordinate the programme;

(e) VET institutions are responsible for evaluating work-based learning.

In Germany, some projects have developed a new role for vocational schools in supporting industry and innovation as regional centres of enterprise. Model projects, such as the GOLO project based in Wilhelmshafen in North Germany, have developed networks of enterprises, revised the school curriculum and initiated dialogue with companies on a regional basis to examine curriculum provision and company training opportunities.

The Netherlands has moved a step further in merging vocational schools and adult education colleges to form regional colleges (ROCs), each forming a network of different educational providers. The main aim is to develop vocational institutions as regional knowledge and innovation centres. Work experience is an important form of contact between education providers and the regional economy. However, some colleges are still outsourcing the provision of work experience places to consultants, thus undermining the objective. Given that the results of the first major evaluation of the reform had not been published at the time of writing, it is difficult to assess its success. There is some criticism that colleges have been given a major new role but were not provided with the necessary additional funding. Neither, at least in the initial phase, have they had the contacts they need to become major

innovation centres. The scale of the change is also emphasised: 'Sectoral cultures and different institutional cultures are still very strong. There are also differences between educational and occupational cultures. The new regional colleges have had to devolve power to the constituent units. It is sometimes difficult to identify coherent policies running across whole institutions' (Brandsma in Attwell, 2000).

More recently, another regional structure of Techno Centres (*Technocentrums*) has been established beneath the ROCs. Like the ROCs themselves, there is considerable variation in how *Technocentrums* operate. In some regions, they comprise just the colleges while, in others, they include employers, social partners and the universities. The most important activity for *Technocentrums* is to provide adult courses organised on a regional basis to meet the needs of regional and local employers. They also aim to stimulate networking between companies and between companies and educational providers – and they aim to improve the use of innovative technologies in the region.

The second major and linked trend is to provide more autonomy for vocational schools in the selection and design of provision, in internal financing and governance, and in curriculum design. This is seen as important in developing closer links between enterprises, economic sectors and social partners on a local and regional basis.

In Italy, under new regulations related to autonomy, every school is now entitled to determine its own programmes, within the regulatory framework, and to create opportunities for work experience. Within professional schools, which provide programmes leading to a professional diploma, students must undertake at least one month's work experience. For VET students, largely in establishments run by religious organisations or trade unions, at least 30 % of their time must be spent on work experience.

In Austria, the situation is more complex. Because the Austrian constitution requires a two-thirds majority for a new school law (which is unlikely, given the deep rift between the social partners), schools have approached the Ministry of Education to obtain 'pilot school status', thus allowing them to enact new curricula and learning arrangements with ministerial approval alone. There may now be more pilot schools than regular schools in Austria, allowing considerable autonomy and innovation in work experience and curriculum provision (Attwell, 2000). But the movement away from school provision towards extended workplace learning, with new roles for vocational schools, is not without critics. Educationalists question whether the system has become overbalanced in favour of work-based learning. Schools are now left with expensive equipment which is under-utilised.

2.5.3. **Countering academic drift and social exclusion**

The extension of work experience was a response to structural problems in education and training. One such problem is the unanticipated problem of a growing 'academic drift' accompanied by lower esteem for vocational learning routes.

This trend can be seen clearly in both northern and southern Europe. In France, reform was driven by a crisis in the education system itself, traditionally hierarchical, bureaucratic and centralised with strong institutionalisation. In the past, there was a strong division between general and technical education leading to higher education and professional and skilled technical work, and vocational training leading to lower paid semi-skilled and unskilled positions. The deep-rooted French concern for formal instruction, examination and certification meant that 'working life permitted compensation for the inequalities of cultural capital' (Gendron, 2000). Nevertheless, this fragile equilibrium was broken by the unemployment crisis of the 1980s with sharp competition for the increasingly rare jobs available to young people and increased competition between young people who had undergone training and less qualified adults already in employment.

The growing competition for jobs for young people in France, has resulted in extending their period of study, leading to a hierarchy of tracks, 'that, by accentuating vocational education's mission to encourage the pursuit of studies, thus tended to devocationalise it' (Gendron, 2000). The crisis also resulted in the growing domination of general education over technical and vocational education, as students have increasingly viewed vocational education as a remedial route. In Germany, a growing problem has been the tendency for the most able students to reject the dual system in favour of academic education through the gymnasium.

The most important problem for upper secondary education in Greece is the gap between general and vocational education. Traditionally, Greek education has offered an academic curriculum focused on preparing students for higher education. In consequence, it has been described as one-dimensional in that it offers few alternatives to students who wish to follow a vocational path. While this is partly rooted in the structure of the economy, it can also be explained by cultural factors. Parents are keen that their children progress in learning as this is seen to be connected with a 'respectable profession', as well as with a higher social status. To this end, they are prepared to pay considerable sums of money to prepare their children for university entrance examinations and to send them to universities in foreign countries. Relatively low salary rates for vocational education graduates and the inferior social status accruing to technical professions

exacerbate this tendency. Vocational education tends to be associated with those who have failed to gain entrance to the higher education system. Such a perception perpetuates the low wages and social status of vocational graduates and also militates against able students entering vocational education.

Generally in Europe, the introduction and extension of work experience through wider curriculum layers, linked to measures to provide alternative vocational routes to higher education, is seen as promoting the esteem of vocational education and training and offering a counter to academic drift.

Several specific interventions have also been designed to assist young people who have become disengaged from the standard pathways into labour markets and are at risk of longer-term detachment from the social mainstream. These interventions, which often offer young people an 'experience of work', have been classified by Evans and Niemeyer (2003) in the following way:

(a) type I: expanded standard routes – interventions aiming to improve foundations and remedy deficits in earlier schooling, to keep young people in the mainstream system and enable them to return to standard institutional vocational or general education;

(b) type II: return for those 'dropping out'– programmes specifically designed for young people who have left regular systems;

(c) type III: alternative institutional pathways – interventions which attempt to broaden and bring into the mainstream alternative routes and pathways, supporting return by providing multiple doors to qualifications for further training and work;

(d) type IV: holistic – 'lifeworld' interventions which have a biographical emphasis, that aim to work with young people's 'lifeworlds', promoting informal learning as well as skills development: return involves broader processes of reconnection into social life through multiple agencies and social support

The first approach is a consistent feature of educational policies in northern European countries although Belgium appears to have been more successful in securing an effective extension of the period of compulsory schooling than other countries. The second approach has been introduced where there are highly structured transition systems with qualification demands determining labour market entry or exclusion (for example, Germany) to assist young people to gain access to vocational education. The third type of approach has been introduced by most countries to complement their 'front loaded' systems. For example, English approaches to 'foundation modern

apprenticeships' have been an attempt to rebrand youth training programmes and establish them as part of a progression route into the higher level 'advanced modern apprenticeships' and part of wider plans to expand educational participation in the 14-19-age band. Finally, the fourth approach is found principally in voluntary and community organisations, third sector, non-profit organisations, which play important roles in supporting disadvantaged young people in many countries. Work experience is a vital component of such interventions.

2.5.4. The enhanced role of enterprises

Another way in which policymakers have responded to the unanticipated problems of extending work experience has been through expanding the role of enterprises as work experience providers in education. This development marks a change in policy and practice in many European countries compared with previous views about the role of enterprises in education and training.

One of the major challenges is to provide the breadth of training required. In theory, new forms of team-based work organisation provide more opportunities for learning in the workplace, provided that enterprises offer learners opportunities to participate in the diverse activities which such teams undertake. However, downsizing and work reorganisation in many large enterprises has often meant that there are fewer staff to supervise work experience and less demand for apprentices/offers of work placements compared with previously. In particular, this extension of responsibility has proved to be quite daunting for small and medium-sized enterprises, and especially craft enterprises, which traditionally have been the mainstay of the apprenticeship system. In particular, they have struggled to provide the variety of learning opportunities required for new forms of work experience. Even large organisations offering apprenticeships can often be faced with considerable challenges in providing work experience in the workplace.

A variety of approaches is apparent across different European countries, reflecting responses to changes in historically constructed arrangements. Some enterprises are prepared to acknowledge their interest in ensuring that young people learn to see the relationship between their formal and informal learning, since this connection provides a foundation for lifelong learning. Recent research has confirmed a widely expressed need to strengthen the links between partners, however much those links vary between countries (Griffiths et al., 2001). Moreover, some writers have questioned how far the general wish for education-business links is actually expressed in practice and have noted a widening gap between the two (Madsén and Wallentin, 2000). In Germany, through a well-funded programme of development

projects in enterprises as well as schools, experiments are proceeding with groups of enterprises collaborating to offer a broader range of learning opportunities. There is also a number of projects focusing on the development of 'learning islands' in workplaces (Attwell, 2000).

Another issue high on the agenda is cooperation between schools and enterprises. Even in dual system countries, coordination between education providers and enterprises has been weak. The issue is receiving attention through moves to strengthen, formalise and assess learning provision in enterprises. In Flanders, the continuing review of work experience includes the aim to develop better local cooperation between different education and training providers and between schools and enterprises. Cooperation with enterprises is organised at both formal and informal levels, with different structures dependent on sector. A series of national agreements is being translated into practice. For example, in the construction sector, there is an agreement about the number of training places to be provided and about arrangements for the guidance and mentoring of students. The aim is that education and training become transparent to enterprises and that they take joint responsibility for building their own future. Work experience students are funded by the government (apart from part-time students who have a labour agreement). Increased support is provided for enterprises in the training of trainers with a new programme for training and supporting workplace mentors, drawn from the pool of skilled workers. In Austria, schools are trying to build closer links with enterprises and the private sector through recruitment of staff from enterprises. There are also exchange visits of teachers and trainers and, in a number of cases, teachers work in enterprises in the summer.

However, such moves are difficult given the need to develop a different culture of learning within work, especially in the southern countries lacking a strong apprenticeship tradition. In Portugal, there are plans to introduce greater curriculum integration between schools and enterprises; this is referred to as 'integrated optimisation'. At present, 'in reality there is a total lack of communication between school tutors and enterprise tutors' (Attwell, 2000). Tutors in enterprises are 'people who happen to be free to work with students' and do not necessarily have any contact with the school. Tutors in schools have a limited knowledge of the work of enterprises and see their main problem as merely securing sufficient work placements (*ibid*). Even here, new initiatives to improve integration are starting to have an impact. Barriers to progress being addressed include problems with insurance and concerns over job security and substitution.

2.5.5. **Experimental measures**

In addition to using work experience to improve school-to-work transition, combat social exclusion, improve parity of esteem between general and vocational education and address academic drift, a range of experimental measures have been introduced to consolidate and extend work experience as an educational strategy. For example, there is evidence that measures have been introduced at regional level to develop and introduce more learner-centred pedagogies, promote autonomous learning and develop competence-based learning programmes (Kämäräinen et al., 2002b).

One assumption behind these measures to increase and promote work experience is that new forms of work organisation and production technologies offer opportunities for learning in the workplace that will promote competence development. Despite the undoubted good intentions behind policymakers' motivation for promoting the value of work experience, such measures have been the hallmark of traditional thinking about the relationship between work and learning. They tend to be built upon management, rather than learning, considerations. While there is clear evidence that work experience tends to increase the level of work-related skills and knowledge (Boreham and Fischer, 2002), the evidence is more mixed as to the extent to which work experience increases learners' motivation to engage in formal learning. It appears that, if the intention to use work experience is to provide occupational 'progression ladders' for the socially excluded, further attention has to be paid to how one involves young people in the formal content of learning that still constitutes the basis of access to professional work.

2.5.6. **The consequences of regional variations**

The responses to these unanticipated problems have different connotations for the southern countries of Europe, where vocational education and training systems tend to be less developed. In a study on the identification, assessment and accreditation of non-formal learning in Europe, Bjørnåvold (2000) draws attention to common features linking Greece, Italy and Spain. These countries have a much weaker tradition of vocational education and training than northern Europe and only over the last decade have serious initiatives been undertaken to address this weakness. The relative weakness of vocational education and training is paralleled by the strength of academic education. Even though academic education no longer represents any guarantee of employment, high income or high status, the value attributed to formal academic accreditation is still substantial. Paradoxically, the relative weakness of formal vocational education and training has resulted in non-formal learning through work experience being the main means of

competence reproduction and renewal. Bjørnåvold suggests that, particularly in southern Italy, there exists a 'vast reservoir of non-formal, experience-based competences' waiting to be tapped. However, he says, the quality of these competences cannot and should not be taken for granted. Proper systems for the identification and assessment of competences gained from non-formal learning and from work experience are needed to improve quality and promote transparency and transferability.

One of the effects of economic and technological change is the uncoupling of traditional paths from both vocational and academic education to skilled work. The result is a diversification in routes and pathways between education and training and employment and a diversification in the ways that work experience is now being used to support transitions to work. On the one hand, this is reflected in a wider range of qualifications held by young people entering apprenticeship, in the age range of applicants and in an increase in the number of women in the traditionally male dominated dual system (although it should be added that there are still very great inequalities in the different sectors between male and female applicants). On the other hand, this is reflected in the wider range and the levels of courses in general education, where work experience is now offered, and in the wider range of contexts, for example the community, where work experience is now offered in an attempt to combat social exclusion.

2.6. Policymakers' new expectations about work experience

The cumulative effects of these changes raise new questions and issues about the roles of education and training providers and host organisations. This section describes current preoccupations.

2.6.1. The wish to identify the outcomes of work experience

A critical approach to the question of what is meant by outcomes has often been absent from discussions about work experience. While the debate about the merit of defining learning outcomes has taken place to some degree in the UK, this is not the case elsewhere in Europe where the concept, which is often used in very different ways, appears to have been relatively unproblematic. A major area for policy development in almost every country in Europe is that of assessment, coupled with a wish to define the learning derived from work experience in terms of learning outcomes. Notwithstanding this, there are

many difficulties with the concept of learning outcomes and assessment which require exploration.

Current policy emphasis on outcomes and qualifications is, in effect, shifting the focus from learning to management (Griffiths et al., 2001). A narrow focus on outcomes might be counter-productive in emphasising the outcome at the expense both of the process of learning and of the relationship between different types of learning (formal and informal). The question of improving learning through informal learning will continue to be difficult for policy makers. Some studies (Griffiths et al., 2001; Attwell, 2000) have described a less instrumental approach to learning outcomes which allows questions concerning the nature and extent of learning to be addressed more thoroughly. Ireland has partly focused on outcomes with a view to ensuring that the processes were achieving their pedagogical purposes.

In Italy, methods of assessment remain a subject of experimentation and discussion, with an attempt to move towards skills-based assessment (Di Francesco, 1999). There has been a movement away from traditional academic assessment towards the identification, recognition and accreditation of skills. In March 2000, an agreement between the government and the regional authorities provided for accreditation of training structures, certification of skills and credits and the reorganisation of training bodies. The major emphasis in Finnish education and training is on self-assessment. The system is based on goal-oriented formative assessment (Lasonen, 2000). However, the new law places greater emphasis on the demonstration of skills and envisages the gradual introduction of a competence-based system. There are fears that this will lead to a more summative assessment regime.

Key qualifications (variously described as generic and transferable skills, key skills and learning skills) are recognised (Attwell, 2000) as being essential curricular elements, although different terminologies and emphases are employed. Hungary emphasises entrepreneurial skills to the extent that they are a common element across the upper secondary education curriculum (Benke and Gorgenyi, 1998). Policy reviews taking place in different countries are not limited to the assessment of students in initial vocational education and training: there is interest in almost all countries in assessing and accrediting skills and the competences acquired in informal and work-based settings, regardless of whether or not they are related to participation in a formal education programme.

2.6.2 **Assuring the quality of work experience**

Interest in assuring the quality of work experience is a recent phenomenon. Historically, apprenticeship systems were based on the assumption that observation of experienced craftsmen over time would guarantee that apprentices acquired the relevant knowledge and skills. Equally, work experience in general education has been predicated on the basis that experience of work was sufficient to enhance work-related skills. The impact of globalisation during the late 1980s and 1990s, however, has forced employers to assure the quality of work experience explicitly. The situation in general education is rather different. Assuring the quality of work placements assumed increasing importance once policymakers began to make a link between work experience and employability: educationalists were expected to be able to demonstrate the return on investment of both learners' participation in, and employers' involvement with, work experience.

Historically, where concerns were expressed about the quality of work experience in general and vocational education, they were viewed as stemming either from the low levels of training of workplace instructors and supervisors and/or the lack of industrial experience of school teachers (Griffiths et al., 2001). During the 1990s, they were seen as stemming from a reliance on 'bureaucratic' and 'mechanistic' approaches to assuring quality (*ibid*). The legacy of this approach to quality continues to impede many attempts to develop new strategies to link quality to learning through work experience. The final chapter sets out a framework which may provide a means of mapping an integrated approach to quality based on learning considerations and requiring explorations beyond an exchange of information about the quality of learning.

The question of quality is complex and its meaning varies throughout Europe (Attwell, 2000). Questions about work experience quality have usually been presented in terms of managing more effectively the relationships between education and business (Winter, 1994) or the social partners (Fischer and Boreham, forthcoming). This concern arises from a sense that work experience is an important component of educational policy and that its continuation depends upon the goodwill of the business community and other stakeholders. Accordingly, it has been argued that steps need to be taken to manage the education-business relationship in order to ensure that work experience offers value for money to students, education and training providers, and the business community.

The concern with value for money has generated a series of terms that are supposed to help in assuring the quality of work experience, irrespective of whether it forms part of general or vocational education. Despite the strong

pressure in EU policy to determine and define a European approach to quality issues, the origins of many of the terms associated with the debate about quality lie in American business management literature and foremost amongst them are notions like 'fitness for purpose' and 'meeting customer expectations' (Winter, 1994).

The term 'fitness for purpose' usually refers to the idea that the measures selected to assure quality offer some reasonable indication about the activity in question (Attwell, 2000). 'Meeting customer expectations' has a close conceptual link with 'fitness for purpose'. Thus, in an industrial setting, quality is seen in terms of fitness for purpose. This is established partly by the views and feelings of customers. Two main strategies have been deployed to meet the challenge of assuring the quality of work experience: the bureaucratic approach and the mechanistic approach.

The bureaucratic strategy is based upon the establishment of management arrangements between educational institutions and workplaces and takes two forms. First, a wide variety of guidelines has been produced throughout the EU encouraging schools, colleges and other intermediary agencies to manage arrangements between education and work more effectively and to ensure that essential health and safety considerations are satisfactorily addressed (see Peffers et al., 1997; Griffiths et al., 1992). Under the second form of management arrangements, social partners have established bureaucratic structures and networks, including government representatives and a number of external experts, to monitor the design and delivery of work experience within companies (Fischer and Boreham, forthcoming). The 'steps and stages' approach being developed in Ireland is one example of this (Griffiths et al., 2001).

An example of a highly regulated approach to quality assurance has emerged in Denmark (Herlau et al., 2000). Here it is the responsibility and duty of trade committees to authorise enterprises as suitable to take students for 'work practice'. Decisions are taken on the basis of a concrete assessment of whether the enterprise is able to complete the work practice in accordance with the respective consolidated act and a judgement about the capacity of the enterprise to offer satisfactory training conditions. The Ministry of Education has proposed that an evaluation institute be established in connection with future reforms to produce 'a better quality assurance of education nationally' (*ibid*). Under present arrangements, students are required to pass a final examination in which their theoretical and practical skills must be shown to correspond to a set standard. The role of trade committees is valued in a model of quality assurance which is highly regulated and expresses many features of fitness for purpose and customer expectation strategies.

Recent research (Griffiths et al., 2001) has noted that there is a continuing place for guides and bureaucratic structures of varying degrees of regulation: they reflect essential legislative requirements and direct attention to necessary management tasks. However, it is not the case, as might be implied from the pervasiveness of the managerial approach, that all workplaces are stable work environments and offer similar contexts for learning.

The alternative 'mechanistic' strategy has focused on learning outcomes. This approach has been seen as liberalising and egalitarian, assigning the prime importance to the result, rather than the form, of learning. Moreover, the exercise is not taxing: an agreed series of common outcomes can be identified for any programme of study and it is on that basis that an assessment of learning takes place.

A growing practice in general education has been to encourage students to plan a work experience placement and manage and evaluate the resulting learning through the use of statements about learning outcomes. A common feature of this approach is to require learners to formulate their own personal action plans, identifying areas for skill development. The plan serves as a 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 narrow and mechanistic way. A growing practice in vocational education has been to use logbooks and assessments to assist learners to identify the outcomes of their learning.

Both bureaucratic and mechanistic approaches have remained locked into the conventional industrial notion of fitness for purpose and customer expectations. The former approach rests on an explicit assumption that the 'customer', in this case the company which has provided the placement, must feel satisfied. The latter rests on an assumption that context is unimportant and that the use of learning outcomes provides a fit strategy for providing evidence that learning has occurred.

The emergence of a European knowledge economy, however, is forcing enterprises to consider how to share, apply and create knowledge. This development is resulting in a polarisation between those companies which are trying to enhance their product and service strategy and become knowledge-based organisations and those which are prepared to modify their competitive and management strategies only slightly (Guile and Fonda, 1999). The concern in enterprises to share, apply and create knowledge suggests that it may be important to develop a more critically reflective approach to the question of quality. Such an approach would take account, among other things, of the different types of environments in which learners undertake their work experience.

2.7. The dynamics of change: contention and contradiction

The measures and developments referred to in this chapter, though widely implemented, are not uncontested. The focus on management as opposed to learning issues is a more serious problem than is generally recognised. While policy makers have tended to emphasise managerial and organisational issues, researchers and some practitioners are increasingly focusing on the relationship between the content and context of work experience and the process and outcomes of learning.

Another debate concerns the weighting of different curriculum elements. Just how closely should education provision be tied to the needs of enterprises and how much should it be oriented to individual educational development? Policy makers have sought to raise the status of vocational and technical education by developing access routes from vocational education to higher education. Despite the good intentions behind this, a number of problems are surfacing. There is a tendency in some countries to increase the theoretical and school-based component of the curriculum and reduce the value of work-based learning. This could dissuade those meant to be attracted through vocational access routes (Griffiths et al., 2001; Attwell, 2000). At the same time, there is tendency in other countries to support learner motivation by establishing mechanisms to accredit prior learning within the framework of certificates. This is leading to a tendency to view workplace learning as a retrospective activity disconnected from formal study. However, without a connective model of learning, progress remains problematic for those targeted by such programmes.

There are also political tensions between social partners. Recognition of work experience as part of the process of developing flexibility in regional labour markets may lead to differing concerns among social partners. Employee organisations may see work experience as essentially an educational strategy and wish to extend the time spent in school or related learning activities. Employers, on the other hand, regard apprentices as workers and wish to reduce the cost of apprenticeship by extending their amount of useful work time. At the heart of the tension is the nature of work experience and who should fund it.

Enterprises sometimes blame lack of work experience places on high costs, employment protection and the poor quality of applicants. Alternatively, they suggest that the difficulty in offering large numbers of work experience placements stems from work reorganisation and restructuring. Increasingly,

flat hierarchies mean that there are fewer staff to supervise work experience. In response they have proposed the development of differentiated apprenticeships (to cater for lower ability applicants), the loosening of employment protection, allowing apprentices to leave half way through their contracts on successful completion of assessments, and shifting payment for the time spent in part-time vocational school to the public sector.

It is becoming increasingly hard to guarantee sufficient training places in the new technology areas attractive to potential apprentices. While there is general agreement on the need to raise the quality of work-based learning, there is a concern that, if monitoring and evaluation are made more stringent, this will discourage employers from providing training places. These contradictions and controversies result from an unresolved tension in the societal role of work experience and the responsibilities of different social actors for carrying out education and training.

This tension is apparent in the implementation of different reform measures. According to Lasonen (2000), concern about the ageing of the population and the recruitment of skilled workers lies behind employer willingness to facilitate school-to-work transition in Finland. Pilot programmes have been launched, backed by the European Social Fund, but there are problems in recruiting and motivating students, given the targeting of groups threatened by social exclusion and which may have difficulties relating to society.

An important distinction can be made between countries with a strong tradition of vocational and technical education and training and those with a weaker tradition. The integration of the dual system with the social structures of society and work is its strength. At the same time, the changes in work organisation, manufacturing and economic demands in modern industrialised economies are destabilising apprenticeship systems, leading to questions about their future utility and viability. Although work experience is deeply embedded in education and training, there are profound pressures for modernisation to deal with economic and social change.

In countries with no tradition of dual system training, work experience is not as integrated into the social structures of work. These countries are introducing a wide range of different measures to extend work experience to new sectors of education and training, to promote employability and develop vocational education and training. However, this emphasis on work experience as an educational strategy lacks the social and structural roles of traditional apprenticeship systems. This debate will continue, even as new measures are implemented.

2.7.1. **Some questions for higher education**

The academic/vocational divide continues to impinge on the status and functions of work experience. There is a general concern to increase the status of occupational and vocational learning in the face of increasing participation in higher education and, interestingly, something of a trend to regard higher education as part of the school-to-work transition. Countries such as the UK have increased the status of the former polytechnic types of institution and the trend can be seen in the changing curricula offered by universities. At the same time, many of the skills knowledge previously viewed as part of the academic world are now becoming part of the occupational curriculum, especially the ability to solve complex problems through forms of research and enquiry. Onstenk (2003) has stated that the ability to shape solutions or recognise 'core problems' has growing importance in developing innovation and job creation.

In a context of the 'academic drift', the implication of recent research (Griffiths et al., 2001) is that work experience in post-16 and higher education will benefit from rethinking. This appears to be as much of a pressing concern in accession countries as in existing Members States. There is evidence that, on the one hand, in Hungary (Benke and Gorgenyi, 1998) there is an urgent need for those continuing their studies at higher levels to get hands-on training and to apply their knowledge in practice On the other hand, in Germany (Attwell, 2000), concern is increasingly being expressed as to how work experience can be used to broaden the base of university graduates' knowledge and skill. Care needs to be taken, however, in not reifying old models of work: employers may be demanding and needing higher level skills and fewer intermediate and basic skills (although this is constantly debated) but they also need the 'polycontextual' skills that are a feature of boundary crossing and working in less hierarchical organisational contexts.

A closer examination of work experience in higher education may now be timely, including an examination of the relationship between the different shapes and modes of learning and knowledge. The evidence of policy studies is that higher education is not transferring ideas from vocational education but is developing its own models of work experience. While the availability and quality of work experience opportunities is a continuing problem for vocational education, at a higher education level it is less so. Employers want to recruit the best graduates and are prepared to provide learning opportunities in the workplace. One concern of teachers in higher education about work experience is that it may double the pressure on students who have to deal with both academic and work-based learning. This suggests that the role of mediation will be significant. Higher education

has a different organisational model of work experience with more emphasis on learning through the development of projects and assignments; universities are also free to build their own networks with local enterprises. They have more autonomy over learning targets and curriculum organisation, unlike vocational schools which have to account to national bodies and social partners.

2.8. Future considerations

The measures and reforms described in this chapter are responses to economic, technological and social change that occurred primarily from the late 1980s to the late 1990s. During this period, policy debate has remained isolated from debates in educational psychology about pedagogy and how people learn. The problems which persist are evidence of this. What emerges from policy discourse is the recognition that work experience has a part to play in supporting young people's employability. However, this recognition is tempered by a tendency to develop its potential through a series of reforms and measures based on previous approaches and assumptions about the purpose and contents of work experience. The weight of policy measures still rests upon the old model of the bridge to work, which will not provide the form of learning increasingly necessary for the future.

A new set of changes has been ushered in by the emergence of a European knowledge economy. This demonstrates the weakness of current assumptions about how the formal educational component of work experience, alongside the informal component of learning acquired through work experience, provide an adequate preparation for working and learning in a knowledge economy. A full exploration of how individuals learn through work experience must raise the following issue. If education is in any meaningful sense to lay the foundations for employability, this cannot simply mean the application of existing forms of knowledge or skills. The new challenge is to develop the ability to mediate the various types of knowledge and skill which arise in different contexts; for this, a connective model of learning is necessary.

CHAPTER 3
The relationship between knowledge work, generic skill and employability

This chapter has two main aims. The first is to identify how economic and technological changes have given rise to a knowledge economy that superseded the post-industrial/post-Fordist economies of the late 1980s and early 1990s. To illustrate the implications of this development, we start by analysing the role of knowledge in the economy. The conventional wisdom about the knowledge economy tends to suggest that the concept refers only to those sectors explicitly based on advanced applications of scientific and technological knowledge. However, this definition is gradually giving way to a broader interpretation of the concept so that it can also refer to those sectors where people are actively involved in transforming product and service delivery. The concept of generic skill, which policymakers claim is a requirement for working in rapidly changing industrial environments, is much more complex than has generally been acknowledged and raises questions for curriculum planners. The complexity is illustrated by distinguishing between:

(a) those conceptions of generic skill which view it as the property of an individual and those which view it in terms of a relationship between an individual and the context in which he/she is working;

(b) the generic skills called for when undertaking work activities of a fairly routine kind compared with novel or unfamiliar tasks.

The second aim of the chapter is to reappraise the relationship between work experience, its curriculum context and the development of generic skill. The concept of 'consequential transition' (Beach, 1999) is introduced as the basis for understanding that this involves taking greater account of the relationship between learning and identity formation. In addition, we argue that if work experience is to support and develop generic skill, it will have to support learners in developing what we refer to as, the 'connective practice of learning'. This involves learning how to relate both the theoretical knowledge acquired in school and the everyday knowledge developed through work experience.

3.1. The new role of knowledge in the economy

3.1.1. Background

The initial interest in the relationship between economic and technological change and the increased role of knowledge in the economy originated in the sociological debate in the late 1960s and early 1970s about the transition from an industrial to a post-industrial society (Bell, 1973; Touraine, 1969). From the mid 1990s, sociologists have argued that information (Castells, 1996) or knowledge (Stehr, 1994) societies are superseding post-industrial societies. The common theme linking these slightly different interpretations about the continuing pace of economic and technological change is that each tends to emphasise that scientific knowledge is now central to most aspects of economic production, political regulation and most spheres of social and cultural life (Delanty, 2001).

One of the most concise explanations of the process of economic and technological change has been provided by Stehr (1994). He conceptualises the changing nature of economic activity within industrial societies as a series of shifts from a material to a monetary and ultimately to a symbolic economy. Historically, as Stehr (1994) observes, most commentators, from the early writings of Adam Smith and Karl Marx onwards, have accepted that industrial economies have primarily been material economies. Economic activity has primarily been based on the use of land, tools and labour. As industrial economies became more mature or advanced, they became monetary economies, increasingly requiring access to capital, in addition to land, tools and labour, in order to support further economic growth and increases in productivity. Stehr further argues that, in the modern era, industrial economies have become symbolic economies since new sources of wealth are based upon the creative capacity of individuals and organisations to use scientific or theoretical knowledge innovatively. Thus, with the exception of the most standardised commodities and services, codified knowledge has become increasingly central to the production of goods and services and is now the primary condition for its further expansion as well as for the limits to economic growth. It appears to be inevitable that we will increasingly live in a knowledge society and in a knowledge economy.

The idea that knowledge now represents the primary source of wealth has become a key tenet of the literature on business economics (Boisot, 1998), management science (Drucker, 1993), knowledge management, organisational behaviour (Nonaka and Takeuchi, 1995) and national innovation systems (Lundvall and Bórras, 1997). It is now claimed that a new

economic and organisational imperative has emerged which is placing enterprises under increased pressure to use their intangible assets (the knowledge and skills of their workforce) in order to innovate and create value for shareholders and customers (Kim and Mauborgne, 1998; Nonaka and Teece, 2001).

Innovation has traditionally been viewed as an exogenous process driven by the application of highly abstract and codified forms of scientific knowledge developed outside the workplace. The analysts quoted above and others, such as Kim and Mauborgne (1998) and Spender and Grant (1996), see this as a gross simplification. They argue that innovation must be viewed as an exogenous and an endogenous process. It can be spurred through the exploitation of knowledge or information available inside enterprises which enables them to offer superior value in their traditional businesses and markets (Kim and Mauborgne, 1998). The challenge in the knowledge economy is to build, combine and integrate the knowledge assets held by individuals and 'communities of practice' (Nonaka and Teece, 2001).

One of the problems associated with this debate is that contributors tend to use the term knowledge in very different ways and also draw different conclusions about which sections of the workforce will become knowledge workers. The diversity of interpretations of the role played by knowledge in the economy can be illustrated by employing Blackler's (1995) distinctions in relation to four different types of knowledge – embrained, embedded, encultured and encoded.

Some writers view knowledge as an embrained phenomenon, existing either in the form of a mental entity located in people's minds or as data located in websites. From this perspective, it is suggested that innovation will take one of two forms. It will either involve managers' attempts to transfer existing expertise from one part of an organisation to another (Drucker, 1993) or filling any 'information spaces' by scanning the environment and identifying new sites of information that may provide an organisation with competitive advantage (Boisot, 1998).

Other writers have approached knowledge as an embedded entity located in social, cultural, technological and organisational contexts. Hamel and Prahalad (1994) suggest that, for companies to innovate, they will have to identify and subsequently exploit their core capabilities. They imply that the key strategic challenge for companies is to identify the specific combinations of specialist social, cultural and technological knowledge and skill which provide them with their unique, competitive edge in the marketplace and which will provide a platform for further innovation in the design and delivery of products and services.

In contrast, other writers argue that innovation, and hence wealth creation, is dependent on the successful acquisition and exploitation of the tacit knowledge held by individuals (Nonaka and Takeuchi, 1995; Spender and Grant, 1996; Wenger, 1998). Writers who adopt this position tend to view knowledge as an encultured phenomenon. They suggest that, if innovation is to become a continuing concern for organisations, the tacit knowledge that is situated within workplace 'communities of practice' must somehow be made explicit and used to improve product and service delivery.

Finally, other writers have recognised that a considerable amount of knowledge is now encoded in the design of products and services (Lash and Urry, 1994) or in computer-mediated signs and symbols (Zuboff, 1988). One consequence of this development is that scope for further innovation is dependent upon the particular skills of those staff who are either involved in the encoding process or who have access to encoded computer-mediated information. They have to be able to relate different types of expertise to create new products and services (Engeström et al., 1995; Nonaka and Teece, 2001) or to know how to use symbolic data to develop collective interpretations and broker new solutions to organisational problems.

The surge of interest in viewing innovation as a knowledge-driven, endogenous process indicates that companies have gradually begun to recognise that the knowledge held or developed within organisational settings may provide them with an advantage that is not replicable in the marketplace. As such it has a different relevance from the acquisition of new scientific knowledge (Spender and Grant, 1996). On the one hand, it has a commercial relevance, since it can be used to help firms to redefine the competitive problem they face and to reconfigure product and service delivery. On the other hand, it introduces a new dimension of skill into work roles that is different from traditional conceptions of skilled performance. In comparison with the 'old economy', where the primary challenge was to coordinate the physical items produced by different employees, the challenge of the knowledge economy is to ensure that knowledge about products and services is shared and does not remain with people or within contexts (Brown and Duguid, 2001).

Knowledge, however, is not a commodity that can be controlled, moved about or distributed at will. If companies are to innovate by exploiting their knowledge assets, they have to nurture a more reflexive relationship between the knowledge held by customers and that of their own employees (Nonaka and Teece, 2001). This has led those firms who wish to compete in the knowledge economy to develop a diverse range of new business development and management strategies to avoid stagnation and

accumulate and apply new knowledge to products and markets faster than competitors (von Krogh and Cusamano, 2001). Enterprises have started to borrow customer capabilities (Prahalad and Ramaswamy, 2000) to produce new joint products and services with other organisations (Victor and Boynton, 1998). They have to support intra-firm transfers of knowledge either by identifying existing features of work environments (Szulanski, 1996) or by creating new environmental spaces that facilitate knowledge sharing and knowledge production. Enterprises have also created 'networks of practice' (Brown and Duguid, 2001) to ensure that all parts of an organisation are actively involved in sharing knowledge.

3.1.2. The demand for knowledge work in the European economy

Several significant developments after the initial phase of economic and technological restructuring have been interpreted as confirming the shift towards knowledge work in the EU economy. The first is industrial convergence, widely proclaimed as the emergence of knowledge-based production (Yoffe, 1996; Thurow, 1999). Two different types of convergence have been distinguished: demand-driven and supply-driven. The former occurs where customers have started to consider products offered by one industry as interchangeable, for example, the competition between EU banking and insurance industries for market dominance in financial services. The latter occurs when products from different industries are perceived to work better together than separately, for example, the breaking down of boundaries in ownership and in product and services development in the telecommunications, computing and entertainment industries. It has been argued that those industries at the heart of the process of convergence constitute the growth industries of the 21st century (Thurow, 1999) and are therefore where the demand for knowledge work will be most evident (Yoffe, 1996). Knowledge work is a feature of employment in industries whose future development rests on the continued application of scientific research.

The second development is the significant decline in employment in the primary and manufacturing (blue collar) sectors and a corresponding rise in employment in the service (white collar) sector since the late 1980s, seen as evidence of the increased demand for high-skill or knowledge work (Green et al., 1999). The continuing trend away from primary industries and towards service industries has been confirmed by the EU report, *Employment in Europe* (EU, 1998). It identified the five largest growth sectors in the period 1994-1997 as business services, health care, education, recreational activities and hotels and restaurants and showed that these accounted for more than 70 % of employment growth. In contrast, the five sectors where

the greatest job losses occurred were agriculture, textiles, the wood industry, iron and steel and retailing. These accounted for just over half of all the job losses. There was considerable variation between individual EU Member States with Portugal and Greece having the lowest share of this growth and the highest growth in Denmark, The Netherlands and Sweden.

Socioeconomic structural forecasts based on expectations of employment trends in The Netherlands (ROA, 1995), the UK (Wilson and Webb, 1995), Germany (Tessaring, 1997) and Ireland (Canny and Hughes, 1995) have also argued that this trend will continue. Although most of the new white collar jobs in the service sector are expected to be in the professional, technical, administrative and managerial occupations, there will also be an increase in low-skill white collar work, such as personal service occupations, (Robinson, 1997; Nickel and Bell, 1995) and a continuing reduction in people employed in manufacturing (Watkins, 1998). Accepting that the introduction of new technology in workplaces has increased demand for white-collar work, not all sectors are necessarily generating new jobs (ILO, 1999) nor looking for higher levels of skill (Freeman, 1997). The conception of knowledge work that surfaces here echoes Malchup's original definition: forms of work which are responsible for producing and transmitting types of knowledge that help people to learn something they had not known previously.

The third development is the reappraisal of the relationship between organisational structures, systems and processes to organisational performance, which has been interpreted as confirming a growing demand for high-skill (Green et al., 1999; Tessaring, 1997) or knowledge (OECD, 1996) work throughout Europe. Apart from resulting in the decentralisation of authority for business decisions to front-line units, the delayering of organisational management hierarchies and the outsourcing of non-essential services, this restructuring has also gradually broadened work roles, occupational profiles and conceptions of skill and expertise in many industrial sectors (Mason, 2000) and organisations throughout Europe (Guile and Fonda, 1999). Organisations are placing a higher value on skills such as 'horizontal communication' (Brennan, 2001) in an attempt to respond more swiftly to customers' needs or even jointly produce products and services with customers. This suggests that some organisations are beginning to define knowledge work in terms of the types of behaviour that support knowledge sharing and knowledge creation to enhance performance as much as in terms of the level of qualifications held by employees.

3.1.3. **The extent of the shift towards knowledge work in the European economy**

One reason why it is difficult to ascertain the extent of the shift towards knowledge work is that analysts tend to adopt different starting points in assessing the responses of enterprises to globalisation and interpreting empirical evidence about industrial and occupational change.

An early attempt to pin down responses to globalisation was provided by Bengtsson (1993). He noted three main responses to increased competitive pressure but did not assume that these constituted an inevitable pattern for every firm. Firms could improve their competitive position by:

(a) adjusting their skill formation strategies to support the development of their existing range of products and services (i.e. the product-driven stage);

(b) building up a reserve of skill to assist them in moving into new markets through making education and training a permanent feature of their business development strategy (i.e. the market-driven stage);

(c) placing much greater emphasis on utilising knowledge and information in novel ways, either to solve organisational problems or to innovate and create new products (i.e. the knowledge-intensive stage).

The third phase, as Bengtsson acknowledged, tended to emerge only in those enterprises, or parts of enterprises, seeking to become knowledge-intensive organisations, since it significantly altered product and service strategies and skill formation strategies.

Schumann (1998) has an alternative explanation. He sees two main models of production. One is based on an intensification of Tayloristic principles of work organisation, exemplified by the idea of 'lean production' (Womack et al., 1990). According to this analysis, although lean production gives workers more freedom to control their work, it only provides limited opportunities for using work process knowledge (Boreham and Fischer, 2002), held by organisational communities of practice, to solve workplace problems. The other model, which Schumann refers to as the 'structurally innovative model', involves extending responsibility and a high degree of discretion for self-organisation of technical and management functions and encouraging workers to use their collective knowledge of work processes to develop novel solutions to organisational problems.

Regini (1995) has highlighted how competitive pressure has led companies to link their product and service strategy closely to skill formation. Regini identifies the existence of two radically different models of skill production in the EU. The 'high added-value' model, tries to support product and service innovation and increase productivity by generating a flow of skilled labour

inside companies in excess, both quantitatively and qualitatively, of actual company demand. The 'low added-value' model, gears the supply of skill to meet demand for existing products and services. In other words, enterprises concentrate upon those segments of the labour market deemed crucial at a particular time and target them for training and development.

Deciding whether the shift from blue to white collar constitutes an increased demand for knowledge work is notoriously difficult. Not all new occupations actually generate additional high skill/knowledge work nor do they necessarily require higher levels of knowledge and skill (Tessaring, 1997). Some new occupations have been little more than substitution of one form of employment for another. For example, in media and communications technology, traditional occupations such as graphic artists, designers, media technicians etc, have been replaced by new occupations such as media operator, media designer. In other cases, although genuinely new occupations have emerged in such production areas as sports and leisure, designer clothing or furniture, there is very mixed evidence about the knowledge component of the work (*ibid*).

Furthermore, the introduction of broader occupational profiles does not automatically indicate a shift towards knowledge work. Some occupational profiles have simply been reclassified as a result of a range of fairly undemanding technical or commercial tasks introduced into existing administrative or clerical jobs (*ibid*). For example, the work of administrative or clerical staff in banking has been reclassified as technical/commercial, since information and communications technologies mean that fewer staff are required to monitor financial transactions. In contrast, other occupational profiles have been expanded through enlargement or enrichment of work roles, as in encouraging employee responsibility for adding value through self-management of work processes, work relationships and customer relationships (Guile and Fonda, 1999). For example, changes within the medical profession have resulted in doctors and nurses assuming responsibility as process managers for health services and facilities. Although these developments have not necessarily increased the level of medical knowledge and skill which doctors and nurses require, they have significantly broadened the contexts in which they are expected to work, the roles they are expected to perform and the associated accountability .The shift towards process management has transformed the range of knowledge and skill required not only by doctors and nurses but also by other professionals.

The shift towards knowledge work is, therefore, more complex than policymakers and some researchers realise (Keep, 1999). This is partly because some enterprises can still chose to adopt either high or low

added-value models of production and skill formation and remain economically viable for the foreseeable future (Bengtsson, 1993; Regini, 1995). The choice between models of production and skill formation suggests that the demand for science-based knowledge work in the EU, as well as elsewhere in the world (Florida, 1995), is most likely to surface either in specific regions (Cooke and Morgan, 1998) or sectors which constitute the 'growth industries of the future' (Thurow, 1999).

This is also partly because many researchers in organisational science and business economics have attempted to explain how enterprises addressed their competitive problems by focusing on science and technology solutions, rather than how exogenous strategies can support product and service development (Kim and Mauborgne, 1998). Enterprises increasingly focus on knowledge-based innovation (*ibid*). They are redefining their competitive problems by identifying their core competences and their internal knowledge-creating strategies, focusing on the performance criteria that matter to customers and adopting business and management strategies that reflect customers' value preferences (Prahalad and Ramaswamy, 2000; von Krogh and Cusamano, 2001). One consequence of the emerging interest in becoming a 'knowledge creating company' (Nonaka and Takeuchi, 1995) has been that a much more pluralistic concept of knowledge has been introduced into the debate about the knowledge economy and knowledge work (Spender and Grant, 1996) and, as a corollary, there is a broader definition of what counts as knowledge work.

If the concept of the knowledge economy and knowledge work is to be defined solely in terms of science as technology within the economy, one way of gauging the transition to this type of economy and work is in terms of the growth of science-based production. If a more pluralistic interpretation of the concept of knowledge is adopted, which reflects the range of ways in which enterprises can act to improve their product and service strategy, a broader set of measures has to be employed to determine the extent of the transition to a knowledge economy. This involves taking account of how enterprises have to reconfigure the relationship between their business, organisational structure and human resource management strategies to support knowledge creation (Guile and Fonda, 1999). Recent evidence estimates that only about a quarter of all enterprises in Europe have adopted knowledge-based product and service strategies (OECD, 1997). Part of the reason for this slow transition is that enterprises are either reluctant to engage in wholesale organisational change or slow to grasp the full implications of the strategic decisions they have taken (Oesterman, 1994). Consequently, they fail to make the systemic changes necessary to become knowledge-based enterprises (Bartlett and Ghoshal, 1993).

Up to the mid 1990s, policymakers tended to concentrate on the macro implications of economic and technological change. Since that time, even when policymakers have linked education and training policies to the emergence of a knowledge economy, they have rarely addressed the complexity of the issues surrounding the debate. The concept of the knowledge economy has primarily been treated as a new reality or context to which people must adjust. This assumption has resulted in a widespread demand from policymakers for national education and training systems to support young people in developing the forms of generic skill commonly assumed as an essential requirement for working in a knowledge economy. This is highly laudable, introducing a future-oriented perspective to EU education and training policies.

Unfortunately, policymakers have failed to appreciate a number of issues, the first of which is the complexity of the concept of generic skill. The second issue is that the type of knowledge required in a knowledge economy is much more multi-faceted than the concept of knowledge associated with many definitions of generic skill. The third issue is that developing generic skill in academic and vocational curricula poses problems that have, so far, not been explicitly addressed.

3.2. The concept of generic skill and the knowledge economy

The concept of skill is ubiquitous in industrial sociology, human resource management and development and vocational educational and training. Yet, as Attewell (1996) has noted, different theoretical traditions are often blind to their own preconceptions regarding the complexities and ambiguities of their definitions of skill. This can be seen clearly in the way that the concept of skill has been defined and used. Traditionally, it has served two purposes (Darrah, 1994), providing the basis for an analysis of both the characteristics of jobs (e.g. task demands and role requirements) and the qualities of people who perform them (e.g. abilities, talents and capabilities). As a result, social scientific and educational studies literature has shared certain common assumptions about the relationship between work and individuals.

3.2.1. The traditional view of skill
One of the main assumptions underpinning the traditional or occupationally-specific conception of skill has been that jobs were fairly stable, that they could be broken down into constituent parts and that the

resulting bundles of characteristic skills were essential for the performance of certain forms of work. Another assumption was that the skills identified were required and that if they were absent, the work would not get done. As Darrah (1994) points out, there is a particular individualism implicit in the traditional concept of skill requirements. It presumes that workers not only possess the requisite skills but also that individual jobs have to be performed by skilled incumbents if they are to be accomplished successfully. It has also been assumed that people could be separated from the contexts in which they work. Consequently, models of skill and/or competence development that emanate from radically different traditions, such as cognitive psychology (Dreyfus and Dreyfus, 1986) and vocational education and training (Jessup, 1990), have tended to treat the workplace as a backdrop to the actions of individuals. It has simply been viewed as a constraint upon the human actions performed within it.

The legacy of these ideas can be traced in the design of most vocational curriculum programmes and qualifications and also in the use of work experience as a component of those programmes. Irrespective of the place of delivery, they have replicated the idea that skill can be broken down into constituent elements by designing discrete curriculum units to teach people to acquire these specific 'skills'. This approach, as Tuomi-Gröhn and Engeström (2003) have observed, rests on the notion of 'identical elements' (i.e. matching elements of skill to elements of training programmes). One consequence of the notion has been that training programmes tried to develop skills in workers by providing tasks that would improve mental faculties, such as memory or attention, or physical performance, such as manual dexterity and spatial awareness. Another consequence has been that most vocational qualifications reinforced these task specific notions by accrediting individual elements of skill separately from one another (Tuomi-Gröhn and Engeström, 2003).

The above assumptions about the relationship between work tasks, the elements of skill and the design of training programmes have been assimilated over a period of time into the language of many EU policymakers. Even when policy makers talk about the need for more generic forms of skill, they tend to deal with traditional criteria. They present skill as though it were a characteristic of a well-defined work role and desired qualities (Keep and Mayhew, 1999). Moreover, policymakers retain a belief that qualifications can be used to certify accurately the level of skill attainment. Defining, developing and assessing generic skills, however, raises more complex questions than have so far surfaced in EU policy debates.

3.2.2. **The concept of generic skill**

It is widely accepted that organisational and occupational changes have resulted in an increased demand from employers for broader-based forms of skill (Green et al., 1999; Kämäräinen and Streumer, 1998). The concept of generic skill, however, has to be treated cautiously for a number of reasons.

Most concepts of generic skill include teamwork, flexibility or problem-solving. A quality such as teamwork, however, is not a skill but a description of how work is, or is not, organised. What constitutes a team must be defined in relation to the working context (Darrah, 1994). The idea of teamwork also presupposes a clear sense of purpose about the activities which teams are expected to undertake and an indication as to the type of knowledge, performance and result teams are expected to achieve. Such qualities are not solely attributes of individuals but are developed through participation in communities of practice (Lave and Wenger, 1991) and are shaped by the actual context of work (Boreham and Fischer, 2002).

When thinking about generic skill, therefore, it is important to differentiate between the type of knowledge and skill required for routine, as opposed to more novel, forms of work. This relationship between types of work and types of generic skill alerts us to the extent to which young people might have to call upon any of the following types of generic skill:

(a) resituating existing knowledge or skill in a new context to help solve a routine problem or unforeseen event or problematic situation (Boreham and Fischer, 2002);

(b) participating in a workplace community of practice to gain access to human and technological resources residing in such communities and needed to solve routine or unforeseen problems (Tuomi-Gröhn and Engeström, 2003);

(c) working collaboratively with others to address novel problems (Eraut, 1999).

Problem solving is another activity commonly defined as an important generic skill but it is closely associated with problem identification and these issues are handled very differently in different work contexts. In some occupations, for example health care as described by Stasz (1998), problems are identified as a result of 'situational assessment' (in other words, identified and solved by the work team) and this may involve technical adjustments as well as changes in occupational roles. By contrast, in other occupations, for example the construction industry, senior staff tend to assume responsibility for identifying problems and the workforce is only called upon to contribute to solving certain aspects of the overall problem.

The concept of generic skill, therefore, has its own complexities and ambiguities which are not always made fully explicit. This situation is further compounded by the different perspectives informing and underpinning debates about generic skill within EU policy and in academic research in vocational education and training. The following discussion highlights four different conceptions of generic skill which have surfaced in social scientific and educational studies literature. In doing so, it draws on the insights about the relationship between skill and work context highlighted by Darrah (1994) and others.

3.2.3. Different types of generic skill

One of the most common uses of the concept of generic skill is to describe a young person's 'work readiness' (Keep and Mayhew, 1999). In some cases this is little more than a demand for basic motivational skills and habits, such as honesty, punctuality, following instructions. In other cases, it reflects a demand for the aesthetic skills associated with routine employment in certain sections of the service industry (Nickson et al., 1998). This might include the ability of employees to manage their feelings and appearance in order to serve the perceived interests of customers (Taylor, 1998) or to speak with an accent which connotes specific socially and culturally defined conceptions of performance and acceptability or to present certain styles of appearance, for example, in hair style, clothing and physical size (Nickson et al., 1998).

A second use of the concept is to refer to the qualities assumed to be required in modern workplaces. One of the problems associated with this approach is that different national education and training and social partnership traditions mean that differences in terminology refer to real differences between underlying approaches to skill development and assessment (Kämäräinen and Streumer, 1998). This can be illustrated by examining the different conceptions of generic skill associated with education and training policy in the UK, Germany and the Netherlands.

In the UK the term, 'key skill', describes the generic skills assumed to be relevant to most forms of modern work and which can be developed in education. One key skills group covers communication, application of numbers, application of ICT and another covers such aspects as improving own learning, problem-solving, etc. UK educational policy assumes that key skills are important for future learning and hence for mobility in the labour market. It implies that skill can be defined in a highly individualistic way that does not take account of the influence of context on development and performance (Guile and Fonda, 1999).

In contrast, the use of the term, 'key qualification', in Germany and in the Netherlands refers to a much more holistic notion of skill (it is more common to use the term competence in Germany and the Netherlands). It explicitly embraces the relationship between the formal component of education (i.e. educational institution) and the context (i.e. workplace) in which skills are acquired (Onstenk, 2003). The idea of key qualifications (Kämäräinen et al., 2002b) transcends traditional divisions of labour and traditional occupational profiles (Simelot, 1991), for example, the personal competences needed either to unlock the potential to memorise and retrieve information or to understand work processes and relationships. It also takes explicit account of the need to integrate specialist knowledge, social and participative competences and opportunities to master new production concepts and contribute to the development of organisational learning cultures (Kämäräinen and Streumer, 1998). A central tenet of policy in Germany and The Netherlands is that competence/skill development presupposes that young people have opportunities to explore the relationship between the different types of knowledge acquired at school and at work. In this sense, the idea of key qualifications implies a more contextual and less individualistic conception of skill.

The concept of generic skill has been used in industrial sociology and political economy to refer to the specific capabilities required for professional and technical work. For example, the term intrapreneurial skills has been employed (Flecker and Hofbauer, 1998) to describe the ability of skilled workers to combine technical skills (i.e. knowledge of products and operational systems), functional skills (i.e. managing personal performance) and motivational skills (i.e. commitment to organisational goals) to ensure continuous improvement in modern production systems. In contrast, Reich (1991) has identified the type of generic skills required by graduates seeking employment in the knowledge economy. He employs the term 'symbolic analyst' to describe the capability to solve problems, take risks, broker solutions and maintain a systems perspective on work roles. Even though Flecker and Hofbauer and Reich see knowledge and skill as being inextricably linked, they tend to define skill as the property of an individual. They play down the influence of work context and the division of labour on the development of skill and further imply that, once individuals have developed, for example, problem-solving capabilities, they will be able freely to deploy such abilities in any context.

Rather different conceptions of generic skill have emerged in organisational studies and in sociocultural activity theory. These conceptions are less individualistic and try to take greater account of the influence of work context on skill development.

The term, intellective skill (Zuboff, 1988), has been coined to refer to the type of skill required to respond to the challenge of working in environments that provide access to encoded knowledge (i.e. symbolic data). Zuboff argues that one of the defining characteristics of intellective skill is working collaboratively with others to interpret embedded or situated knowledge and to use it to broker solutions to problems that arise within workplaces.

In contrast, the type of skill required for working in flat, team and network-based organisations has been defined as polycontextual (Engeström et al., 1995), a term which refers to the increasing demand on members of work teams to engage simultaneously in multiple activities, enter territory with which they are unfamiliar and call upon and utilise different forms of expertise to resolve workplace dilemmas. Furthermore, Engeström et al., in common with other researchers (Guile and Young, forthcoming), argue that polycontextual skill presupposes that people have the capability to cross organisational boundaries to collaborate with other communities of practice in order to mediate between different forms of knowledge. Engeström et al. note that this boundary crossing appears to be as much a feature of new product development and technological innovation as it is of more traditional forms of work, such as teacher education, community and social work and industrial production. In contrast to other conceptions of generic skill, Zuboff and Engeström et al. recognise that, in order to innovate and solve problems, people have to be able to mediate between different types of knowledge held by experts and between different work contexts and social relationships. In this sense, they are much more conscious of the social, cultural and communicative basis of skill compared with many other writers.

3.2.4. Generic skill and the knowledge economy

One way of making sense of the contrasting *foci* and emphases of generic skill is to distinguish between conceptions which view it primarily as the property of an individual and those which explicitly recognise its contextual basis. This helps to distinguish the diverse range of meanings associated with the term. It also distinguishes between the diverse demands for generic skill, since it is clear that the concept serves as an umbrella term for the skills required in different work contexts. All of this alerts researchers to the complex nature of the problems faced by policy-makers as they try to devise educational policies and reform qualifications to support the employability of young people in the knowledge economy.

Figure 2. **Typology of generic skill in the knowledge economy**

	FOCUS	Nature of work activities	
		Routine problems	**Novel problems**
Conceptions of Skill	Individual conception of skill	Key skills (i.e. certified evidence of literacy, numeracy and IT)	Intrapreneurial skills (i.e. ability to work effectively in immediate work context) Symbolic analytical skills (i.e. ability to apply specific form of expertise)
	Contextual conception of skill	Key qualifications (i.e. using technical, socio-cultural and participative competence in the workplace)	Polycontextual skills (i.e. ability to mediate between different forms of expertise) Intellective skills (i.e. ability to mediate between symbolic data) Boundary crossing skills (i.e. ability to operate effectively in different contexts)

Qualifications have traditionally been concerned with standard-setting, denoting the proportion of any population which has achieved a specific level of academic or vocational attainment. The emphasis on generic skill, however, represents a shift towards demonstrating a potential to achieve, albeit in different ways from those usually associated with conventional qualifications. Qualifications, as Chisholm (1999) has argued, are losing relative significance as well as gaining absolute significance. By this, she means that credential inflation has fuelled expectations amongst employers for higher levels of qualifications, while the demands of the knowledge economy have simultaneously forced employers to look for broader evidence of skills and competences among new recruits.

Another way of making sense of the concept of generic skill is to distinguish between those conceptions which presuppose work activities of a fairly routine kind and those work activities concerned with novel or unfamiliar issues. This distinction presents vocational educators and workplaces with an entirely new set of problems and addressing them involves two separate but linked issues. The first problem is how to assist learners to develop generic skills in context-specific situations (Young, 1999b). This presents educators with the following challenges. First, they have to recognise the limitations of the individual conception of generic skill, that skill can somehow be implanted into an individual in such a way that it becomes a form of property that can be applied mechanistically. Second, they have to embrace the contextual conception of skill. This involves devising curricula that assist learners in recognising the situatedness of knowledge and skill and mediating between the diversity of forms of knowledge and skill to produce new knowledge, skill and social practice. This is a daunting challenge, not least because it is extremely difficult to specify the nature and level of generic skills, such as problem-solving. Moreover, the learning potential of workplaces for developing such skills varies enormously (Guile and Young, 2003).

The second problem is how to formulate new pedagogic practices which will provide learners with opportunities to mediate theoretical knowledge, acquired through formal study, to the everyday knowledge acquired in workplaces so that they can develop new knowledge and skill (Griffiths and Guile, 1999). Addressing these challenges, however, is slowly forcing greater attention to be paid to the role of work experience in both general and vocational education. There is growing understanding that work experience provides an opportunity for young people to mediate between different modes of learning and types of knowledge and, in the process, develop new knowledge and new skill.

3.3. Educational policy, work experience and employability

3.3.1. The transition from education and training to working life

In response to the challenges presented by economic and technological restructuring, EU Member States and other countries, have undertaken several initiatives to support the transition of young people from school to work and to enhance their future employability (Stern and Wagner, 1999b). Two of the most common measures were to encourage schools to increase the opportunities for post-16 students to undertake work experience and to

fund new educational programmes which include a work experience component for unemployed or disaffected young people (Griffiths et al., 2001). Although valuable in their own terms, these initiatives do not provide the basis for assisting learners in recognising the situatedness of knowledge and skill or to mediate between different types of knowledge and skill to produce new knowledge, skill and social practice.

This is primarily because many models of work experience have addressed skill development by relying on old models of learning in the workplace (Guile and Griffiths, 2001). Most models of work experience are geared to quite traditional conceptions of work and work roles, based on fairly mechanistic conceptions about the process of learning. As such, they fail to support students in developing more 'future-oriented' capabilities, such as seeing the limitations of existing forms of work practice and working with others to conceive alternatives. In addition, the challenge of preparing learners to relate different modes of knowledge and different contexts of learning to one another has rarely been addressed (Guile and Griffiths, 2001). Despite the best intentions of policymakers, work experience has often affirmed the idea that its main purpose is simply to assist young people to learn how to reproduce the activities they encounter. Consequently, very little attention has been given to how to prepare young people to move between different types of work contexts and how to relate formal and informal learning.

3.3.2. Rethinking work experience as 'consequential transition'

One of the most interesting insights into understanding learning through work experience has been provided by Beach (1999) and Beach and Vyas (1998). His ideas about transition help us to explore how work experience can assist students in making effective transitions from education to work.

Rather than seeing work experience as a strategy whereby students learn to transfer knowledge and skill acquired in one context (work) into another context (education), it is important to see it as a process of consequential transition (Beach, 1999). The idea of consequential transition is about movement in relation to purposes and Beach argues that greater account needs to be taken of how, in the process of transition, identities and even contexts themselves (i.e. school, work, curriculum) might change.

Four different types of consequential transitions – lateral, collateral, encompassing and mediational – have been identified by Beach. He acknowledges certain affinities between the first and second pair in that they involve people moving between sets of activities that are changing slowly compared to the changes that individuals experience as they move between them. Beach and Vyas' account of high school students working in a fast food

restaurant illustrates this type of transition. The main characteristic of encompassing and mediational changes is that they occur when the rate of change in an activity is relatively rapid compared to the change that is required by the individual involved. Beach suggests that these types of transition occur when new technology is introduced in workplaces and workers often have to develop new skills without being able to seek advice from more experienced staff who are themselves still coming to terms with the change.

The concept of consequential transition is relevant to rethinking how work experience might support students to learn and develop. First, it can be used to question the conventional notion that moving from school to work is relatively unproblematic, provided that students have the appropriate skills and personal attitudes. Such a view supports the idea that it is a fairly straightforward matter of building 'employability skills' into school/work curricula (Taylor, 1998). This approach takes no account of the fact that formal education and learning in the workplace serve different purposes. The former aims to ensure that students acquire the forms of knowledge required to pass examinations, while the latter aims to support students to acquire the everyday knowledge to help them operate effectively in workplaces.

Second, the concept of consequential transition reminds educators and policymakers that transition is not merely a matter of launching a student to learn in a workplace. Workplaces are very different and learning opportunities are not distributed equally across them. In knowledge-poor workplaces, the primary goal of most activities is to support a highly routinised form of product and service delivery. This emphasis on routine activities can severely restrict the form of knowledge and skill developed. In contrast, in knowledge-intensive workplaces, young people are likely to have opportunities to participate in specialist communities of practice and be encouraged to respond to novel or unfamiliar issues (Fuller and Unwin, 2001). The disparity between workplaces suggests that one of the challenges for educators is to design models of work experience that provide a foundation for young people to make a transition into work contexts which involves addressing routine as well as novel work problems.

Third, it can be used to question the idea that it is possible to support learners to become adaptable by building generic competences into curricula, despite the attachment of governments to this course of action. If the intention is to support learners to become more adaptable, the starting point has to be to assist them in manipulating the diversity of forms of knowledge required for vocational performance (Billett, 2003). In other words, there is a need to support learners to understand that, even though vocational performance may be informed by the knowledge expressed in

curricula, what constitutes the knowledge required for performance and judgements about effective performance has a situational genesis. This suggests that the knowledge required for vocational performance is not some form of context-free (i.e. generic) skill that is the property of the individual; it is a product of being able to learn through work experience within workplaces.

The fourth issue is that work experience constitutes a form of 'horizontal development' (Beach, 1999). Traditionally, most studies of human development assume that the processes of knowledge and skill acquisition are hierarchical, involving either the apprehension of sets of concepts of ever greater abstraction or mastering higher levels of technical or craft-based skill (in other words, a vertical process). In contrast, Beach's work suggests that learning at work is a horizontal process, by which he means that young people acquire forms of knowledge embedded or situated in specific contexts. Moreover, this situated knowledge can take a variety of forms: it could be knowledge about how to participate in a community of practice, to change and vary work practices or to connect different fragments of codified knowledge to resolve work problems. If young people are to benefit from work experience, it follows from Beach's argument that they have to 'learn how to negotiate their own learning' in a new context and in a different way from how they learn at school.

One of the conclusions that can be drawn from viewing learning as a consequential transition is that it is not work experience *per se* that guides young people in negotiating their own learning or using their school-based knowledge to analyse workplace problems and debate critically different ways of tackling them. Rather, it is engagement in a community of practice that helps students to filter out actions, arguments and solutions and thereby develop their teamwork or problem-solving capabilities in the workplace. This can only occur if learners are provided with opportunities to participate in communities of practice (Lave and Wenger, 1991). It is the space provided by legitimate peripheral participation that enables learners to develop the capability to construct new knowledge, identities and skills and to transform (rather than use) cultural tools that originated elsewhere. A transition of this form involves the idea of progress and is best understood as a developmental process. Such transitions may involve changes in identity, as well as changes in knowledge and skill; they are processes that involve the full person and are not just learned attributes or techniques.

The notion of consequential transition and the distinction between vertical and horizontal development have implications for the design of work experience in vocational and general education (Guile and Griffiths, 2001). In

the past, it made sense to associate classroom learning with the acquisition of subject knowledge and workplace learning as something taking place incidentally during activities designed for other purposes. However, as the learning demands of educational institutions are beginning to change through the exhortation to create a lifelong learning culture and through their desire to become knowledge-using and creating organisations, the old distinction between different sites of learning is also changing. Prioritising either of the above forms of learning involves developing new learning relationships between, and within, education and work. The challenge is to recognise the contribution which different forms of learning can make to each other. A central requirement for such a curriculum will be to find a way to support young people to mediate different modes of development and different modes of knowledge in order to develop new knowledge, skill and practice.

3.3.3. Work experience, curriculum and pedagogy

Suggestions for rethinking the contribution of different forms of learning (vertical and horizontal development) have recently been put forward (Guile and Young, 2003; Young, 1999a). It has been pointed out that the attempt to relate different types of knowledge and different processes of learning involves addressing two issues. The first is curriculum specialisation, since this lies at the heart of the separation of work from education, the separation of vertical development from horizontal development. Curricula almost inevitably involve hierarchical assumptions about learning goals because the intention is to support learners gradually to understand the complex relationship within or between fields of knowledge. Achieving this, however, involves curricula being built on a more realistic understanding of how students actually acquire the tacit knowledge involved in participating in 'communities of practice', whether in workplaces or in educational institutions. The concept of 'connective specialisation' (Young, 1998) is important in exploring the basis of a new relationship between subject knowledge and the learning which occurs outside formal settings and the knowledge that is acquired through participating in communities of practice.

The idea of 'connective specialisation' provides a new basis for thinking about how work experience can support young people to relate their formal and informal learning, develop new knowledge and skill and hence support their employability. Traditionally, work experience has provided access to types of knowledge and modes of learning that are not tied to school subjects, while schools have provided access to fairly stable and relatively insulated curricula. In order to assist students in connecting their theoretical and everyday learning and using these connections to develop new insights,

knowledge and skill, work experience has to become part of new programmes of learning that do not rest on the assumed separation or superiority of modes of knowledge and learning.

The second issue is what we refer to as the practice of learning, supporting learners to view the development of knowledge and skill as a process of 'resituation'. Instead of seeing acquisition of knowledge in schools as teaching young people to decontextualise their actions and thoughts, and skill development as a process only tenuously related to abstract thought, educators and policymakers would work together to ensure that new learning goals and processes are introduced to help young people resituate their knowledge and skill.

The principle of connectivity and our idea about the practice of learning provide a way of theorising a new relationship between curriculum and pedagogy which will allow learners to grasp connections between different modes of knowledge and types of learning. We suggest that, in the first instance, it will involve encouraging learners to:

(a) use theory as a conceptual tool to link their workplace experience to their programmes of study as well as using work experiences to transform their understanding of the relationship between theory and practice;

(b) develop the intellectual basis to criticise existing work practices in school and at work and take responsibility for working with others to conceive alternatives;

(c) resituate their everyday knowledge and skill and contribute to the development of new knowledge, new social practices and new intellectual debates;

(d) develop the confidence to cross organisational boundaries or the boundaries between different and often distributed communities of practice and connect their knowledge to the knowledge of other specialists, whether in educational institutions, workplaces or the wider community.

The implications of this are explored in greater detail in the next chapter.

Theories of connective practices of learning through work experience

The commitment to increase access to education and training reflects the long-standing concern of policy makers concerning the relationship between qualifications, employment and economic success (Dore, 1976). Despite the exhortations of policymakers about the importance of learning throughout the life cycle – whether in the workplace, the community or through formal education – the challenges posed by the emergence of the knowledge economy have not been adequately addressed. One reason is that pronouncements about lifelong learning tend to rest on assumptions about learning, itself a term which generally suggests enrolment in part-time or full-time education and training (Guile, 2001). This is because policymakers and researchers equate learning either with the acquisition of qualifications or with the accreditation of some form of work-based experience within the framework of a recognised qualification. They also tend to assume that opportunities for learning can be achieved either through adapting the current educational institutional framework to increase access to learning or through the deployment of information and communication technologies to transform access to different modes of learning. Another assumption is that the constant accumulation of qualifications constitutes evidence of the creation of a learning society or a lifelong learning culture.

The tenacity of these assumptions has obscured several considerations of the purpose and process of learning. The first is that learning involves the construction of new knowledge, identities and skills or the transformation (rather than the application or use) of something acquired elsewhere (Beach, 1999). This idea of learning as a socially constructed activity introduces an extra dynamic into the debate about lifelong learning: the idea that learning is a developmental process involving mediation of the relationship between different types of knowledge and experience (Guile and Griffiths, 2001). It also involves changes in their identity, a process which arguably has to occur if their future actions are to be informed by new understandings and insights.

A second consideration is that living and working in a knowledge economy or knowledge society does not simply involve the application of existing

forms of knowledge or skill or a swathe of rules. Rather, it presupposes that people can respond 'reflexively' (Guile, 2001) to emerging economic, political and social issues in an innovative and creative fashion by establishing new rules to address the unexpected consequences of modern life (Lash, 1999). This emphasis on reflexivity also introduces an extra dynamic into the debate about lifelong learning. It suggests that, if policymakers want to prepare people for living and working in a knowledge economy/society, they will have to incorporate into education and training policies a strategy for learning as 'acquisition' and 'participation' (Sfard, 1998).

Knowledge and skill should not simply be conceived, as by many policymakers, as commodities to be built into curricula, acquired, converted into people's private property and used mechanistically to inform conduct. This perpetuates the notion that learning is chiefly concerned with acquiring the form of knowledge or skill warranted by qualifications. Once learning has been conceptualised as a social process, and living in a knowledge society or economy has been conceptualised as a reflexive process, a new agenda for learning emerges. This chapter sets out to analyse how individuals learn through work experience and to identify how the connective practices of learning through work experience can prepare people to learn and work in a knowledge economy or society. In order to analyse the practice of learning through work experience, the theoretical underpinning of new approaches to learning in different contexts – and in relation to lifelong learning – is explored in some detail with the aim of grounding theory in new practice and practice in theory.

4.1. The relationship between learning and work: the meaning of context

4.1.1. Background

Interest in how individuals learn at work has surfaced in different branches of the social sciences, such as educational studies, organisational science and educational psychology, as writers have become more interested in analysing learning in settings where learning is not the primary objective of the activity being undertaken. There have been several notable contributions (e.g. Billett, 2002; Eraut, 1999; Engeström, 2001; Fuller and Unwin, 2001; Lave and Wenger, 1991; Brown and Duguid, 2001; Straka, 2000). One of the unifying themes in this work is the influence of context on learning and in developing vocational competence. At first sight, this appears to imply a consensus about how to theorise the relationship between working and learning; however, on closer inspection, it is apparent that the term context

is interpreted in different ways. Some writers treat context as though it was separate from the individual. Context becomes akin to circumstances that act on individuals from outside or circumstances individuals have to adjust to (van Oers, 1998b). This leads writers to focus on:
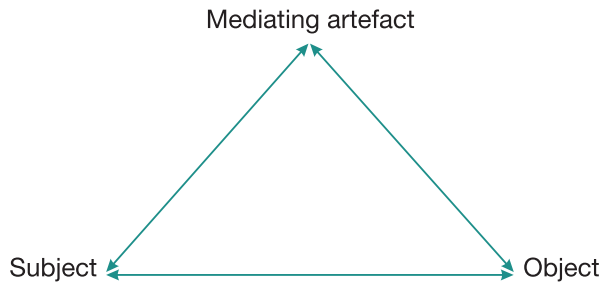
(a) the way in which certain factors in the workplace facilitate access to knowledge (Boreham and Fischer, 2002);

(b) identifying the constraining or enabling factors that appear to influence learning in workplaces (Eraut, 1999; Fuller and Unwin, 2001);

(c) disregarding context totally and conceiving learning as a self-directed process, implying that it is context-independent (Straka, 2000).

This last view of context also means that learning is often treated as though it were a form of cognitive action, variously defined as 'analytical', 'intuitive', and 'deliberative' (Eraut, 1999), or an informal and incidental matter that occurs intuitively.

The tradition upon which we draw (activity theory, Vygotsky, 1978) offers an advance on other perspectives about learning and context for a number of reasons. It stands in contrast to other major theories of learning which have conceptualised learning as the response of humans to an external environment or as a progression through a series of predetermined conceptual stages or as the processing of information. According to Vygotsky, learning is a 'complex mediated act'. By this, he meant that the process of learning involved coming to terms with the relationship between an individual, a task or activity and mediating artefacts (e.g. theoretical knowledge, communication and information technologies). It was enhanced through the support of an 'experienced other', that is, an educator or a more experienced individual (not necessarily a colleague) who could assist learners to use artefacts to develop their knowledge and skill.

Learning was to be understood in the context where it occurs and in relation to the enabling means, human or technological, provided in that context. Figure 3 is the common expression of Vygotsky's idea of cultural mediation of actions, shown as the triad of subject, object and mediating artefact. In the case of learning through work experience, the concept of mediation introduces a radically different idea about learning compared with the notion of learning-by-doing, which has been invoked by many educators to explain the difference between school-based and work-based learning' (Resnick, 1987). The concept of mediation implies that individuals have to understand the purpose of an action and the part that certain mediating artefacts (people, technologies, language) contribute to the realisation of that action because these artefacts help to disclose the world in a meaningful way.

Figure 3. **Cultural mediation of actions - a triad of subject, object and mediating artefact**

The idea of mediation was extended by Leont'ev (1981) who drew a distinction between the idea of an individual action, what could be accomplished alone, and collective activity. His example of hunting featured a traditional division of labour; some people concentrated on beating the bush in order to drive a deer into the trap set by other members of the team to kill it. The former role could only be understood with reference to the wider context. Leont'ev paved the way for an understanding of learning in and between contexts because he drew attention to the need to take account of how the division of labour and the rules adopted by specific communities influenced the process of working and learning.

One of the strengths of activity theory, compared to other theories of learning, is that it helps to highlight the dual function of contexts. In the first place, contexts support the particularisation or specification of meaning by constraining cognitive processes and eliminating some meanings as not relevant. They also bring about coherence with the larger whole, providing meaning in the sense of 'putting things in context'. This acknowledges the inextricable relationship between context and cognition and views social practice as the intersubjective medium for the formulation of mind and the development of expertise (Cole, 1996).

The focus on collective activity draws explicit attention to the collective organisation of work and hence the collaborative basis of working and learning. This is partly because the idea of movement between contexts (e.g. education and work, one work site or team to another) involves individuals

and groups mediating different forms of knowledge in relation to one another in work settings (i.e. a horizontal dimension of learning) rather than being escalated through a hierarchy of knowledge and skill in educational settings (i.e. a vertical dimension of learning). It is also partly because the idea of movement explicitly acknowledges that tensions are likely to exist as learners cross boundaries (Tuomi-Gröhn and Engeström, 2003).

This focus has to be supplemented before it can constitute a sufficient conceptual resource for analysing the influence of context on learning. This is primarily because most models of work experience have a curriculum context related to bodies of knowledge assumed to be relevant to the development of vocational or professional practice (Guile and Griffiths, 2001). This presents educators with a double challenge. They have to assist learners to acquire theoretical knowledge, as well as the everyday cultural and technical knowledge relevant to particular forms of work, and to mediate between these different forms of knowledge either to resolve workplace dilemmas or address curriculum assignments. This involves taking explicit account of the relationship between the curriculum and the workplace, a challenge which we have defined as 'connectivity'. In order to explain the notion of 'connectivity', we next provide a brief outline of the concept of the zone of proximal development and how it offers a way to theorise learning in and between the context of education and work.

4.1.2. The relationship between activity and learning

Unlike the tradition in certain psychological fields (e.g. behaviourism, cognitivism) that separate the content and form in cognition (the former seen as culturally developed and socially and historically determined and the latter determined by biological maturation), Vygotsky (1978) argued that the form and content of cognition were interdependent. He employed the concepts of theoretical and everyday knowledge to differentiate between the different forms of learning and cognition in everyday life, including work and formal education. Nevertheless, he saw them as inextricably related. For Vygotsky, the interdependence of content and form was the basis for understanding the historical development of concepts and cognition by an individual.

These ideas about concept formation provide a natural starting point for any attempt to understand the relationship between the different types of knowledge developed in education and in workplaces. On the one hand, the acquisition of theoretical knowledge extends the meaning of everyday knowledge. On the other hand, the continuing development of everyday knowledge often leads to transformations in theoretical knowledge when the latter cannot address problems arising in practice.

From this perspective, the challenge for educators is to create the conditions to enable this relationship between these two forms of knowledge to flourish (Schneuwly, 1994)[3].

The term, 'zone of proximal development', was formulated by Vygotsky to refer to the conditions which support learning and development. He defined it 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).*

Learning is likely to be developmental if educators and learners are sensitive to the implications of the zone of proximal development. In other words, the development of knowledge, skill and identity follow learning processes (the range of pedagogic strategies employed to facilitate understanding) and these processes are most effective when learners are in constant interaction with a more experienced other. The challenge in the zone of proximal development, therefore, is to assist learners to move beyond the stage of mastery of which they are capable, through participating in social practices that provide the support of a more experienced person.

This process of mental functioning, the ability to conceptualise, act in accordance with conceptualisations, even to revise actions in the light of the limitations of conceptualisations, does not simply occur either by itself or as a consequence of physiological or emotional maturation. From Vygotsky's perspective, this type of thinking has its origins in participation in social activity; this participation is mediated by different types of cultural tools and the primary resource for supporting mediation is speech. It is through speech that people learn to symbolise concrete events, give them a general meaning and relate them to more abstract or codified forms of knowledge.

The concept of the zone of proximal development, therefore, is highly relevant to educators interested in trying to overcome the separateness of education and work and mediating between the different types of knowledge. The concept highlights the inadequacy of the assumption prevalent in policy literature that the inclusion of an 'authentic' element of experience in the curriculum constitutes is a sufficient basis for broadening the basis of learning. It suggests that educators need to identify what it means for learners

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[3] Vygotsky's original empirical work was mainly undertaken in the elementary or primary phase of education. For this reason, his theory of learning was initially viewed as having a restricted focus. The work of Engestrom (2001) and Hedegaard (2001) has helped to broaden awareness about the value of his insights for analysing learning more widely within society.

undertaking work experience to operate at the lower and upper level of the zone in formal education and in the workplace. Vygotsky originally invoked the idea of the 'upper level' to highlight what a learner could accomplish when working with a more experienced other. This implies not only an evaluation of a learner's capacity to work with a more experienced person but also an evaluation of the tasks undertaken by a learner. Without this dual analysis, it is difficult for educators to be in a position to identify whether a learner is operating at the upper or lower end of the zone and how to support further learning and development. This definition of an 'experienced other' focuses attention on the range of social practices which learners have to master if they are to participate effectively at school and at work. This is what Hedegaard (1998) refers to as the 'traditions' of practice. However, it is also important to recognise that, in the context of the knowledge economy, new social practices have to be developed and this brings a new challenge to educators: supporting learners in exploring the 'possibilities' of practice. Before addressing these issues in more detail, we go on to distinguish the concept of social practice from the wider social scientific debate about practice.

4.1.3. **Practice and social practice**

The origin of the concept of practice has a long pedigree and lies in the notion of *praxis* (Marx, 1844) as the sociohistorical context for a materialist account of consciousness and the making of history (Wenger, 1998). Since then, studies on practice in a variety of guises in the social and human sciences have attempted to address the constitution of dominant as well as local cultures (Bourdieu, 1990; Geertz, 1973; Giddens, 1984; Latour and Woolgar, 1987; Wenger, 1998).

Sometimes, the concept has been used to reveal how the comprehension of situations into which one is thrown can be 'pre-reflexive' (Gherardi, 2000): in other words, this does not necessarily lead to distinctions being drawn between subject, object, thought and context. What is acquired is tacit knowledge of situations, a form of knowledge which cannot always be explained to others (Polyani, 1962). The concept has also been used to convey the transmission of knowledge through the senses by virtue of familiarity with previous situations and a refinement of sensibilities towards those situations (Gherardi, 2000). From this perspective, practice constitutes the 'connoisseur's knowledge' (Turner, 1988) possessed by members of professional communities of practice. The concept of practice has been employed in philosophy and linguistics to highlight the contribution which language makes to the creation of the meaning of different human activities and to the negotiation of new meanings or new activities. It implies that one of the key requirements of learning is mastering the rules of the 'language game' (Wittgenstein, 1958) or the genre (Bakhtin, 1986).

In most cases, practice in vocational or general education reflects the influence of the sociologist/anthropologist, Pierre Bourdieu (1990). The concept in Bourdieu's work is primarily used in countering purely structural accounts of culture and in emphasising the generative character of structure by which cultural practices embody class relations in the form of symbolic or practical mastery. These two extremes are balanced by Bourdieu by focusing attention on the *habitus*, the product of the material conditions of existence and the set of principles for generating and structuring practice. This has resulted in a tendency in vocational education to focus on the *habitus* of the workplace and in general education to focus on how the *habitus* of social class reproduces inequalities.

The way in which we use the concept of practice shares the emphasis on the interdependence of context, culture and human action. By drawing on the approach to practice in activity theory, however, we introduce a distinctive focus in that it provides a means of conceptualising the way in which the relationship between context and activity provides the conditions for learning and development. Thus, in this sense, the concept of social practice can be used to identify activities contributing to human development; namely the acquisition of cultural tools – symbolic (language) and material (computers) – through interaction in the zone of proximal development. It also can be used to identify the transformations that occur in those activities as well as in cultural tools (Hedegaard, 2001).

One of the best-known examples of using social practice to illuminate learning has been provided by Jean Lave (1988) in her critique of the information processing theory of learning (i.e. cognitivism). For Lave, social practice, the form of participation in everyday activities, is the key to grasping the complexity of human learning and development. Learning occurs through a special form of social practice, which she refers to as 'legitimate peripheral participation' in the diverse 'communities of practice that are part of the society in which people live and work' (Lave and Wenger, 1991). This allows newcomers gradually to become members of a community of practice by providing opportunities to demonstrate that they have acquired the knowledge, skill and identity required for full membership of a community of practice.

The idea of the situated basis of learning has been extended to cover explorations of participation in 'workplace communities of practice' (Brown and Duguid, 1991; Wenger, 1998), 'communities of learners', and 'vocational communities (Ellström, 1997). Writers such as Brown et al. (1989) and Collins et al. (1989) have formulated the concept of 'cognitive apprenticeship' as a strategy for introducing a more explicit 'real world' element into general or vocational education. The main supposition behind their proposals was that

conceptual knowledge can be compared to a set of tools and that activity-practising, in other words using intellectual tools, promotes cognition.

The widespread and rapid acceptance of the general proposition that learning occurs through participation in communities of practice has, however, tended to mask some limitations of Lave's own thesis. A number of writers have argued that she has been too conservative in generalising about learning on the basis of case material derived from studies of very stable communities of practice (Billett, 2003; Engeström, 2001; Hedegaard, 1998; Guile and Young, forthcoming). One consequence has been an attachment to unreflected social practice in everyday activities, where there is no qualitative differentiation between the knowledge and practices associated with different communities (Guile and Young, forthcoming). The idea of situated learning can also lead educators to regard the activities associated with different communities of practice as standards for learners. Although it is important to recognise the situated basis of all forms of learning, the idea of situated learning itself has to be subject to more critical consideration because it can imply that there is no need for a reflected goal for development beyond the activity or tasks in hand. This appears to be the case because many advocates of situated learning tend to neglect the relationship between different types of learning and development (Hedegaard, 1998).

Situated learning all too often fails to address the situation in which people are increasingly called upon to act as 'boundary crossers' (Engeström, 2001; Engeström et al., 1995) and to make varied types of 'consequential transitions' in their normal lives (Beach, 1999). These developments point, in turn, to the emergence of new types of social practice which people have to learn, engage with and develop. Mastery may not be possible solely through participating in one specific practice. It may be that full 'membership' involves participating in another community of practice in order to be counted as having mastered the practices of the first community (Lemke, 1997), a development that suggests the need for a much broader or multifaceted set of reflected goals for learning and development.

Despite acknowledging these, there are, nevertheless, several advantages in conceptualising learning as participation in sociocultural practice. First, it illuminates the contrast between the forms of work experience that might provide learners with the capability to respond to routine, as opposed to novel, work situations and hence understand the changing requirements of work. The notion of practice can be used to identify the type of knowledge and skill associated with a specific mode of work, what is privileged in a specific situation and what is 'supra-cultural', having applications across a range of occupations (Billett, 2003). Second, it places the focus firmly on the range of social practices which support

learning in the zone of proximal development in and between education and work. Third, it highlights the range of communities of practice that may have to be 'mastered' if people are to develop the capability to mediate between different types of knowledge and to produce new knowledge.

4.2. The practice of learning through work experience

Preparing people to learn and work in a knowledge economy/society has assumed that individuals are able to use their learning in creative ways. The challenge has been seen as supporting learners to develop generic skills in context-specific situations. One interpretation of this challenge has been to suggest that it is consistent with generic competences, for example, problem-solving skills, associated with current work on key qualifications and key skills. Our definition of a generic skill differs, recognising the situatedness of knowledge and skill and the need to mediate between different types of knowledge and skill. We believe that the starting point for learning through work experience is acquiring what we have called the four 'practices of learning'. We describe these four practices and their relation to one another below.

4.2.1. The practice of acquiring theoretical knowledge

One practice, which is crucial to all forms of learning and development, is the activity of thinking. In general terms, thinking can be characterised as a process guided by procedures or social practices, either in daily or professional life, with dialogue and argumentation as central activities (Hedegaard, 2001).

There are, however, different types of thinking, affected by the form of knowledge with which a person is engaged as well as the motive for engaging with that knowledge. Most writers consider time spent in formal study as providing the most sustained exposure to acquiring different types of societal knowledge [4], organised and codified according to different criteria. Some have highlighted different types of codification and different purposes which codification serves. For example, Hedegaard (2001) differentiates between three types of societal knowledge which learners may encounter in formal education: empirical, narrative and theoretical knowledge.

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[4] An alternative classification of the types of knowledge encountered in formal education has been formulated by Bernstein (1996). He differentiated between what he referred to as 'vertical' and 'horizontal' knowledge structures. The former term refers to subjects, such as mathematics, which involve very general theories which attempt to integrate knowledge, whereas the latter term refers to subjects, such as sociology, which consist of a series of specialist 'languages'.

Empirical knowledge is associated with the positivist tradition in natural science and characterises the fact-oriented conception of teaching prevalent in most formal education systems. Its main presupposition is that the world can be understood either by accruing information in pursuit of evidence or resolving puzzles within subject domains. From this perspective, it is possible to achieve objective knowledge about the world and, as a corollary, the knowledge contained in different subject or domain areas does not change unless there is evidence that it is in some way incorrect. This results in a view of theory as a series of generalisations arising from empirical data.

Narrative knowledge is found in the human sciences, literary theory and in 'folk theories' (Bruner, 1990). Its key characteristics are that it allows different perspectives or goals to interact and that it involves feelings and emotions. The driving idea behind narrative knowledge is giving meaning to personal experience so that its situated character might be transcended and related to some general characteristic of human life.

The origin of the idea of theoretical knowledge, as employed in activity theory, lies in the work of the Russian psychologist, Davydov (1990), who built upon the work of Vygotsky. It is markedly different from the empirical conception of theoretical knowledge. Its aim is to help formulate a new understanding of the world based on theoretical generalisation, requiring learners to analyse and identify a primary general relationship in the subject studied. Having identified and isolated an initial abstraction – in Davydov's terms, a kernel concept – learners are encouraged to model and examine this general relationship. For example, in the discussion of learning in this book, mediation would constitute an example of a kernel concept, since its implications could be explored through using that concept to model the relationship between context, activity and participation, etc. (Guile, forthcoming). The notion of the kernel concept presupposes that the meaning of the theoretical concepts is dialectically established through the relation of concepts to each other, initially through being introduced to learners in formal educational settings. It also presupposes that concepts have a generative character (enabling learners to establish links between the primary concept, in this case, mediation, and its diverse developmental forms and manifestations in everyday life). The meaning of theoretical concepts is subsequently elaborated and extended as learners attempt to use them either to interpret everyday experiences or as concepts which have to be revised in the light of their adequacy to interpret such experiences.

Until now, curricula have been informed primarily by empirical and narrative conceptions of knowledge. These traditions, however, have not proved to be particularly effective in assisting learners to combine the

general principles of the knowledge they have acquired with the content and cultural practices of everyday life (Young, 1998). Moreover, one of the most pressing challenges in vocational (Tuomi-Gröhn and Engeström, 2003) and professional education (Hoskin and Anderson-Gough, 2003) is to assist learners to overcome the gap between theory and practice, a challenge which involves developing a more connected understanding of the relationship between theoretical and everyday concepts. Given that the theme of this book is the connectivity of theoretical and everyday knowledge, it follows that the alternative interpretation of theoretical knowledge which we have introduced may offer a greater range of resources than empirical or narrative knowledge for assisting learners to address this challenge.

The kernel concept model provides a frame for supporting a learner to develop a more connected and deeper understanding of the world. The kernel concept concerns the relationship between the different components of a specific body of knowledge and, by extension, can be used to help identify relationships between theoretical knowledge and the events that occur in the real world. Its main attraction is that it sensitises educators to the development of higher order thinking, the ability to grasp conceptual relationships within subject areas, to generate hypotheses and to test ideas in practice.

The concept must be applied with caution, otherwise it may present more problems than are at first apparent. It may at first sight imply that the process of learning consists primarily of adapting either to established theoretical structures or to working relationships. For this reason, it is important to recognise that Davydov's theoretical model is itself socially located, which suggests that the use of the kernel concept will have to be situated, in relation to the type of context learners enter, through a process of negotiation between learners and educators. An example might be understanding the different type of expectations about work and performance at work associated with Tayloristic and post-Fordist conceptions of the division of labour before undertaking work experience.

Discussion about the relative merits of kernel concepts ([5]) raises a number of issues for educators interested in developing a more connective relationship between theoretical and everyday knowledge. The first is the extent to which the design of curriculum frameworks and work experience

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[5] The idea of the kernel concept has also been used by Onstenk (2003) to formulate his concept of 'core occupational problems'. There are, however, some differences between our respective uses of the idea. Onstenk's primary concern is to use it as a guiding principle to reform VET curricula to assist learners to develop the competences they require to resolve what he refers to as 'core occupational problems'. Our concern lies in identifying the practices that facilitate learning within and between the contexts of education and work. This means that the idea of the kernel concept is fundamental to the development of theoretical thought in both contexts.

programmes might be rethought. In curriculum terms, this would suggest a further paradigm shift from enhancing the traditional emphasis on formal logic, empiricism and transmission pedagogy strategies through the use of reflection (Miller et al., 1991) and learning-by-doing (Dehnbostel, 2000) towards a more dialectical approach. The hallmarks of such an approach would be to recognise the socially located nature of all forms of knowledge – the canonical knowledge of the curriculum as much as the local knowledge of the workplace – and therefore the need for dialogue between educators and learners about how to connect these forms of learning more effectively (Guile and Young, forthcoming).

The second issue is the extent to which this approach can assist learners to develop an initial theoretical relationship between the kernel concepts introduced in general and vocational education and the everyday knowledge associated with the world of work. This suggests that connecting the worlds of education and work is not simply achieved through facilitated reflection, with emphasis merely on providing a space for learners to deliberate on their experience of work. Rather, it involves assisting learners to grasp how theoretical knowledge can be transformed into active knowledge that relates to the diversity of work practice as much as to the diverse manifestations of specific work practices (Billett, 2003) and how everyday knowledge can be used to test out the efficacy of any initial theoretical generalisation (Guile and Young, 2003). The third issue concerns the use of language to personalise theoretical concepts, and so understand the world outside formal education, and to use everyday experiences critically to interrogate theoretical concepts. This presupposes that learners are able to conduct a 'dialogic inquiry' (Wells, 1999) and can participate in this way in a community of practice.

4.2.2. The practice of dialogic enquiry

Semiotic mediation, using language to make sense of the world, can play a major part in enabling learners to collaborate effectively in activities of increasing social and technical complexity (Halliday, 1993). In particular, symbolic mediation provides the cultural means to support knowledge construction within individuals and between people. The discursive practices which allow less experienced people to gain access and relate to the cultural resources (including assistance from more experienced others) that the environment provides or the provision of specialist tools (such as computers) to resolve problems can be referred to as 'dialogic inquiry' (Wells, 1999).

The idea of dialogic enquiry is influenced by the ideas of Bakhtin (1986) as much as those of Lave. The two features of linguistic communication which are particularly important for an understanding of discourse are as follows. The first

is the idea of 'speech genres', suggesting that language is imbued with the individuality and subjectivity of a speaker's current concern and yet is shaped and developed within a certain generic form. So, in the case of workplaces, the meaning of a conversation is established by coming to terms with the highly personal use of specific words as well as the mode of explanation used to communicate to colleagues. The second important feature is the notion of 'responsivity', attempting to understand the speech genre being used and reflecting that understanding when constructing one's reply.

An important insight provided by the notion of dialogic enquiry is that the relationship between language and the forms of knowledge associated with different communities of practice is much more complex than has generally been assumed. Language serves a dual role: on the one hand, it is the principal medium in which the understandings gained in the past are made available for acquisition and use in the present. On the other hand, the process whereby these understandings are shared is far from being one of simple transmission and repetition. In fact, these processes are a form of 'metaknowing' whereby knowledge is built through reflecting on social practice, using the speech genre of the community of practice to make connections between the different objects and activities.

In the case of learning through work experience, the emphasis on dialogic enquiry draws attention to the use of language to examine and reformulate questions about the specific social practice (Billett, 2003) they encounter and the expectations, goals and procedures of those practices that only find tangible form and purpose when enacted in particular circumstances. This means that 'learning on the fly' (Beach, 1999) in workplaces is not simply a process of the imitation of work practices, nor is it the prereflexive assimilation of connoisseur's knowledge nor even the knowledge stored in a *habitus*, as many other models of work experience imply. It is an initiation into a language that already embodies conceptual relations and which enables individuals to locate their understanding within a 'space of reasons' (Bakhurst, 2001) and, in the process, begin to make sense of the practice of work and consider it in relation to the practice of education.

These observations raise a number of issues for educators involved with work experience. First, there is the importance of language and other symbolic resources, such as numerical and graphical data, as mediators in the zone of proximal development. Sometimes learners may grasp concrete events they encounter in workplaces in the form of an image which barely appears to relate to the abstract world of theoretical knowledge. On other occasions, they might symbolise a concrete event through the use of a metaphor which allows them to give this event greater meaning by relating it

to an abstract visual impression of the work process. The challenge for educators is to assist learners in grasping the relationship between abstract and concrete aspects of the social practices in which they are engaged, possibly through encouraging them to use the narrative conception of knowledge to personalise their understanding of this relationship (Bruner, 1996). A second issue is that the mediation of context-specific learning with ideas or practices originating outside those contexts implies that learners possess the confidence and capability to cross the boundary between education and work. This involves learners in coming to terms with educational institutions and workplaces as activity systems.

4.2.3. **The practice of boundary crossing**

One of the main challenges faced in work experience is learning how to cross the social and cultural borders between education and work. This is a complex process as illustrated by the work of Beach (1999), Engeström (1996) and Tuomi-Gröhn and Engeström (2003).

In learning in formal settings, the goals of instruction are clearly stipulated, the learning processes clearly identified and educators' responsibilities for intervening to support learning clearly defined. However, the process of boundary crossing means that the zone of proximal development is far less clearly demarcated. This is partly because learning in workplaces consists chiefly of undertaking actions whose object and motive is not learning as such. Although the purpose of work is normally the production of some form of product or service, there are still opportunities to learn and develop. Nevertheless, the form of learning in which individuals engage when they cross the boundary between education and work or between one work context and another involves a process of horizontal development, learning how to mediate between different forms of knowledge and performance in different contexts.

The concept of boundary crossing provides a fresh perspective on the question of transfer of knowledge and skill between education and work. Consequential transitions mean that transitions between education and work result in a change in identities, and even the contexts themselves are changing. This implies that educators have to support learners to overcome the situated nature of their learning by supporting them to 'resituate' (van Oers, 1998a) that learning in the wider context of their formal programme of study.
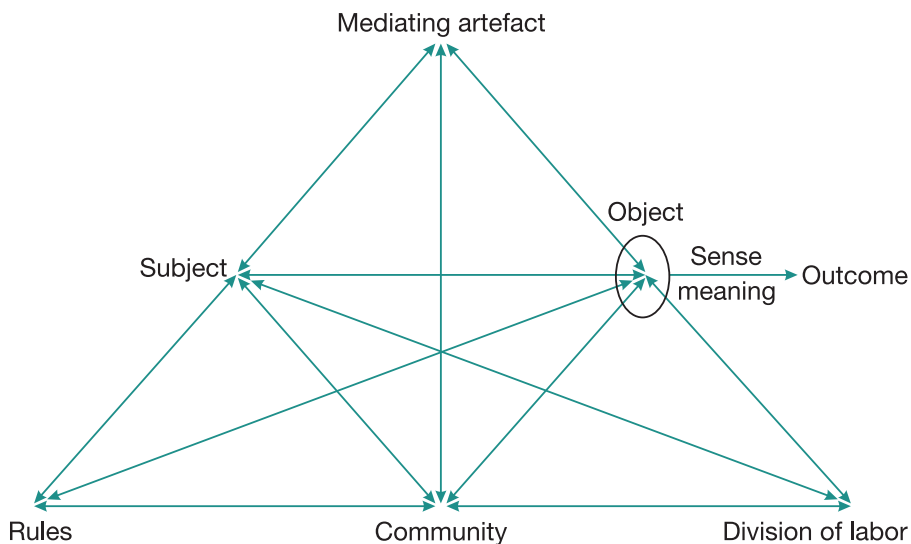
Consequential transition forces a recognition that the transition from education to work or from one work context to another will be significantly mediated by the extent to which learners can generate theoretical formulations which help them to connect the workplace they are about to enter and their formal programme of study (and *vice versa*). For example, if learners are about

to undertake an encompassing or mediational transition, it will be important to be able to generalise about the new context they are about to enter in a way that reflects the uncertainty and unpredictability of the workplace (Beach, 2003).

The focus on transitions draws educators' attention to the value of identifying the upper and lower level of the zone of proximal development. Unless this occurs, learners are likely to assume that the goal of learning is to develop an attachment to existing, albeit in their case new, social practices (i.e. the lower end of the zone). Thus, they fail to recognise that, all too often, social practices can inhibit learning and so have to be challenged and new social practices developed (i.e. the upper end of the zone).

Developing new social practices through engagement with the challenges presented by boundary crossing is addressed by Engeström (Engeström, 1996; Tuomi-Gröhn and Engeström, 2003). His starting point is to expand the concept of mediation, the idea that learners use artefacts to mediate their understanding of the object of any activity in which they are engaged, into a model that could be used to analyse learning in workplace or educational institutions – in his terminology, an activity system (see Figure 4).

Figure 4. **An expanded concept of mediation**

The idea of an activity system refers to a way of analysing a specific community of workers who share a common object and motive over time in relation to the set of rules, division of labour and wide range of tools they share and which characterise their organisation. It is best thought of as a theoretical lens which

allows us to train our gaze in different directions and different levels of magnification to help us answer the questions that concern us.

The main limitation of most approaches to learning, according to Engeström (1987), is that they are predominantly designed for classroom settings and do not appear capable of dealing with the problem of learners moving from education to work or from one work context to another. Many ideas about learning in workplaces (for example, Kolb's 'learning cycle' and Schön's notion of 'reflection-in-action') and the diverse ways in which they have been adapted in general and vocational education (Onstenk, 2003) assume that the learner guides his/her own activities in a variety of situations in order to acquire knowledge and skill. One of the apparent strengths of these approaches is that they identify specific processes and actions over which learners can exercise control to inform knowledge and skill development. They are far less effective, however, when trying to take account of the learning that occurs when individuals move between two contexts, such as education and work.

Learners engaged in boundary crossing require forms of support that go beyond the limitations of traditional approaches to learning at work. This is necessary because learners have to identify not only the location of the knowledge which they need to participate effectively in the 'traditions of practice' but also how to question and transform the rules and division of labour which characterise an activity system if they are to work collaboratively to explore the 'possibilities of practice'. This is only likely to be achieved if the problems learners are asked to address are not preset by educators and they are supported to identify problems and encouraged to analyse and identify solutions for them. Addressing this challenge, according to Engeström, presupposes a radically new approach to learning which he defines as an 'expanded theory of learning'. By focusing on the activity system, he argues that individuals and groups should be supported to identify the contradictions within and between activity systems. This provides them with the basis for questioning existing forms of practice and beginning to identify and implement new forms.

The notion of expanded learning provides a pedagogic framework which educators can use to help individuals cross the boundary between education and work by mediating theoretical and everyday knowledge. First, it emphases a focus on the interactions between activity systems (i.e. education and work) and not simply on the specific elements (i.e. management and assessment of work experience) of those interacting systems. Second, it suggests that identification of contradictions will provide learners with the basis for formulating a theoretical generalisation to begin to question existing forms of practice and to begin to identify and implement new forms of practice. Third, encouraging learners to 'model' the perceived

contradictions they experience assumes that they will also have opportunities to test and consolidate their proposed solutions and, hence, pave the way for implementing them through new forms of practice in different activity systems. This cycle of questioning, modelling, implementing and reviewing any proposed innovation is akin to a form of 'developmental transfer' (Tuomi-Gröhn and Engeström, 2003); in other words, the learning and development that occurs impacts on the activity system itself as well as on those individuals and groups who work within it.

Using the cycle of expanded learning to change the organisation of work experience raises the critically important issue about the relationship between theoretical and everyday concepts. For Engeström, changes in activity presuppose changes in concepts and result in changes in cognition; thus he is inclined to assume a unidirectional relationship between activity, concepts and cognition. This, of course, does not always occur and so it is necessary to pay attention to the intersubjective dimension of learning, in other words, the challenge of resituating new ideas and new practices.

4.2.4. The practice of resituating knowledge and skill

The process by which people acquire concepts cannot be separated from the context in which they find themselves. This means that it is important to identify the way in which individuals learn to resituate the kernel concepts contained in the curricula so that they are able to use them to understand new situations.

One of the clearest examples of this is provided by van Oers (1998a and 1998b). He argues that once it is realised that the kernel concept model itself has to be situated, it is possible to identify the way in which kernel concepts constitute the basis for assisting learners to formulate theoretical generalisations. The proviso is that educators appreciate the iterative and interpretative basis of such a process. Van Oers invokes the notion of resituation ([6]) through 'activity development' (van Oers, 1998a) to capture his ideas about kernel concepts. This notion rests on two ideas.

The first idea is that any activity (theoretical thinking, practical action) undertaken by humans can be realised in different 'forms of activity patterns'. Writing with a pen or a computer, or speaking to a group of students or a workplace community of practice, evoke different patterns of thought and action. The second idea is that, in any situation, the object of an action (i.e. writing an essay, conducting dialogic enquiry in a workplace) can motivate someone to engage with more complex activities than they ever originally

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[6] Van Oers employs the terms 'recontextualisation' (1998a) and 'resituation' (1998b) in different papers to refer to the same process. For the sake of simplicity, the latter term has been employed in this chapter.

envisage. It can lead them to call upon existing or new theoretical knowledge to stimulate innovation and creativity. This suggests that it is important to identify the way in which learners resituate concepts through the different activities in which they are engaged. The idea of resituation describes the process that occurs when individuals and groups act upon the recognition that any situation provides, at least in principle, an opportunity for an alternative course of action. For van Oers, resituation involves seeing an original activity from a new perspective rather than trying to extract it from its original context.

The practice of resituation presupposes that educators distinguish between the different types of boundary crossing which they might encounter through work experience. One type occurs when people carry out a known activity in a new context (e.g. students on work placement undertaking tasks that they have already performed in an educational context). The other type occurs when individuals and groups use the problems that arise while undertaking a task as the basis for developing a new pattern of activity in a new context.

At first sight, this suggestion has some affinities with Engeström's idea of identifying contradictions; however, it differs in a number of crucial respects. First, the notion of resituation is sensitive to the degree of change (i.e. emotional, identity) that often has to occur in individuals before they feel confident in trying out new practices in work places, partly because t this learning often constitutes a resource for change in the future rather than the impetus to participate in immediate change. Second, it highlights the contribution of theoretical knowledge made available through the curriculum to horizontal development. For example, as Hoskin and Anderson-Gough (2003) suggest for accountancy, many firms have translated the articulated concepts of accountancy theory into workday practices, so the concepts have become second nature. This suggests that without appropriate pedagogic support and awareness of the value of theoretical knowledge, learners are unlikely to develop their knowledge of the historic purpose and cultural implications of such concepts from immersion in workplace activities.

Third, the different forms of resituation implicitly acknowledge that people can grasp the connection between different activities by developing new goals, new actions and new strategies. On the one hand, new patterns of activity and new meanings may emerge from the original context which constitute a modification of the original activity rather than an alternative realisation of that activity. On the other hand, it may not be possible to resolve the original problem unless learners are able to envisage 'theoretically-constructed worlds', requiring contact with ideas outside the immediate situation.

The idea of envisaging 'theoretically-constructed worlds' is highly suggestive for educators involved in developing pedagogic practices to support learning through

work experience. It alerts them to the value of supporting learners to develop conceptual frameworks which are not confined to particular situations and which do not generalise from specific cases. Addressing this challenge involves activity development in the zone of proximal development – in the two senses that van Oers identified – as an underpinning principle for the design of curricula and as a pedagogic practice to motivate learners to resituate their experiences and, with the support of a more experienced other, mediate concepts, ideas and practices in relation to the problems they are confronting. This may involve developing the capability to interpret new situations in workplaces in the light of the concepts they have developed as well as to deal with counterinterpretations.

4.3. Towards a connective pedagogy: the traditions and possibilities of practice

This chapter has analysed social practices which, in combination, can support those in work experience to mediate between the different demands of education and work. These practices constitute a way for learners to develop generic skills in context-specific situations and thus they are equally valid for initial and continuing education.

We have also discussed the way in which the concept of the zone of proximal development can be used to delineate the 'traditions of practice' that have characterised students' (i.e. learners') lives. We contrasted this with the idea that the upper level is delineated by the 'possibilities of practice'.

Thus, our argument is that, if the primary purpose of work experience is to immerse learners in existing social practices, it may only result in their developing an attachment to a set of unreflected social practices. This means that they are unlikely to identify any qualitative differences between the knowledge and practices associated with different levels of activity undertaken within specific communities of practice. If work experience is to prepare people to learn and work in a knowledge economy/society, educators have to find ways to present learners with opportunities to engage with the traditions and possibilities of social practice. They must develop a more connective perspective upon the learning that occurs within and between the context of education and work. This is likely to involve the following: the redesign of curricula using the idea of kernel concepts and consequential transitions as structuring principles; the development of strategies to support dialogic enquiry and the resituation of knowledge and skill; and, when the occasion requires, the use of the theory of expanded learning to address tensions arising in schools and workplaces.

Modelling work experience and learning: illustrations from European practice

This chapter presents illustrations of the concept of connectivity by means of exploring case studies. The case studies are not, however, presented as complete demonstrations of the connective model; rather, they suggest movement towards the idea of connectivity and represent attempts to engage with real questions of learning. Points of development towards greater connectivity are identified in the discussion of the case studies.

5.1. Questions of connectivity

The context of work has undergone fundamental change over the last 20 years. The cumulative effect suggests that the old models of learning at work need to be rethought. New conceptual 'tools' need to be developed to assist learners who are undertaking work experience both to understand the evolving forms of work practice and the types of dialogue encountered in workplaces and education and to develop perspectives on the diverse activities in which they are engaged. This is the context in which both the concept and methodology of connectivity have been developed, enabling exploration of the different contexts in which learners found themselves in work experience and the influence of those contexts on the process of learning.

There are several guiding ideas behind the concept of connectivity. One is that learning involves knowledge that occurs through having grasped an idea as much as having accomplished a practical action. A second is that relating theory to practice and vice versa involves mastering the four connective practices of learning discussed in Chapter 4. A guiding idea concerning the methodology of connectivity is that of contradiction as a source of change and development (Engeström, 2001). We have used these guiding ideas in relation to the illustrations of European practices of learning through work experience to address some of the problems outlined in Chapter 2.

The connective model of work experience, with its emphasis on the relationship between the practice of work experience and the context of work,

enables new theoretical questions about learning at work to be asked. It allows the practical implications of these new questions to be explored through examples of emerging practice which attempt to establish a more connective approach to learning through work experience. Throughout these explorations of practice, we have kept the following questions in mind. How far do learners:

(a) understand and use the potential of theoretical knowledge as conceptual tools for linking their workplace experience to their programmes of study and thus seeing it as part of a whole?

(b) develop an intellectual basis for identifying the limitations of existing work practices and taking responsibility for working with others to conceive alternatives?

(c) develop the capability of resituating existing knowledge and skill in new contexts as well as being able to contribute to the development of new knowledge, new social practices and new intellectual debates?

(d) become confident about crossing organisational boundaries or the boundaries between different, and often distributed, communities of practice?

(e) connect their knowledge to the knowledge of other specialists, whether in educational institutions, workplaces or the wider community?

5.2. Modelling work experience and learning: lessons from Denmark, Germany, Sweden and the UK

Rethinking learning through work experience is a critically important issue, as much a concern for educators as policymakers. Work experience helps to lay the foundations for lifelong learning in two senses: by learning how to participate in organisational communities of practice, an activity which will be a consistent feature of future working lives; and by providing an opportunity for young people to develop the capability to mediate between the different types of knowledge and skill which arise in different contexts, an activity which is a growing feature of work in modern production systems.

Growing European interest in these issues is gradually resulting in the emergence of a new model of work experience. In order to highlight the diversity of starting points and concerns in different countries and different systems, two examples have been selected from apprentice-based work experience and two examples from school-based programmes of work experience. Each represents a slightly different engagement with the idea of reflexive learning which informs and underpins the connective model of work experience.

5.2.1. **Apprenticeship-based examples: systemic innovation**

The Danish and German examples illustrate different manifestations of the tension between the 'external' and 'internal' (Young, 2000) reform of vocational and education and training systems. The former involves changes in the relationships between VET and the social partners, often concerned with such issues as new management responsibilities, new arrangements for learning and changes in qualifications. The latter involves attempts to change the pedagogy and curriculum of VET programmes, aiming to improve both the relevance of the knowledge and skills acquired by students on VET programmes and the effectiveness with which both are transferred to workplaces.

The Danish and German examples identify, in slightly different ways, the contradiction that lies at the heart of many of the assumptions of policymakers: that the focus of reform is falling on the wider context in which VET takes place, in other words, the curriculum and management structures associated with the work experience to the neglect of pedagogy. The Danish illustration specifically addresses the challenge of implementing external reforms. It highlights how one vocational school is attempting to implement new pedagogic practices to support learners in developing a more connective perspective about the relationship between theoretical and everyday knowledge. The German illustration describes an attempt to overcome the separation of work process knowledge from formal curricula through the introduction of new learning arrangements in enterprises and vocational training schools to assist apprentices in resituating both types of knowledge and developing a more connective understanding of the relationship between them.

5.2.2. **School-based examples: local innovations**

In contrast, the school-based examples indicate the challenges of internal or local experimentation and innovation. Although arising from quite different educational contexts, both examples illustrate how different types of educational institutions have attempted to address the contradictions raised by the connective model of work experience. The Swedish example illustrates pedagogic practices which assist learners in developing the polycontextual skills that are required to mediate between the different forms of expertise encountered by learners as they cross the boundary between education and work. The illustration from the UK provides some insight into the new pedagogic practices that will be required to support learners in developing a more connective conception of the relationship between the learning that occurs in school and in the workplace.

In order to trace the implications for the future practice of work experience in Europe, each example has been analysed in relation to the six dimensions of work experience identified in the typology set out in Chapter 1 (see Figure 1 in Section 1.4): the purpose of work experience; the assumptions about learning and development; the practice of work experience; the management of work experience; the role of the education and training provider; and the outcome of the work experience (i.e., the forms of knowledge, skills or broader capabilities which students have developed).

5.2.3. **Danish illustration of system innovation: Teknisk Skole Ishøj Vejebrrovey 45**

5.2.3.1. *Context*
Danish vocational education and training policymakers have tried to address economic and technological pressures in two broad ways (Christensen, 1999). First, they have introduced a series of curriculum reforms to support VET to move towards developing future-oriented skills rather than traditional occupationally-specific skills. Second, they have urged vocational education and training providers to make VET more learner-centred through more flexible access routes for young people and by offering them more choice of vocational pathways. This has led to the introduction of a new scheme – optional bridging activities – which enables learners to test different types of vocational education before selecting a specific occupational field.

Work experience, in this case a period of placement in an enterprise, was a compulsory feature of Danish vocational education and training until 1995 (Christensen, 1999) when the Danish Ministry of Education accepted that an alternative form of work experience could be offered to apprentices in 'vocational factories'. The change arose from concern that, since it was not always possible to find relevant placements within the Danish economy, many young people were being denied access to training.

Under the current arrangements in the Danish system, learners may choose to begin their training either at a college (*Erhvervsskoleafdelingen*) or in an enterprise. This means that vocational schools and employers have to be prepared to accept apprentices and ensure that they gain access to the theoretical and practical aspects of their training. Danish VET policy insists that, irrespective of the route learners choose, knowledge of culture and workplace environment is an essential part of apprenticeship, since it is considered a prerequisite for students to enter the labour market.

The purpose and characteristic of work experience in Danish vocational education and training has gradually shifted from a bridge model towards a

work process model. The current challenge is to develop new pedagogic practices in the vocational colleges, the vocational factories and enterprises that support learners to develop more future-oriented capabilities. This is leading the system to place a much stronger emphasis on the practice of learning through work experience.

5.2.3.2. *Rethinking the purpose of apprenticeship*
Until the recent reforms, the primary aim of work experience in Denmark was to support apprentices in developing work process knowledge. Vocational colleges tackled this by trying to adjust the content of the vocational curriculum so that it reflects the changing demands of the workplace, for example, through the introduction of computer-based assignments to support ICT skill development. 'Vocational factories' have attempted to simulate conditions that enable apprentices to test out their knowledge and skill in a work context. Enterprises have tried to provide apprentices with opportunities to call on the knowledge and skill acquired in college to resolve actual problems. This combination of practices has proved to be a mixed blessing. On the one hand, it ensured that apprentices, for example in the textile industry, became familiar with new methods of cutting, combining colours in fabrics and designing clothes as well as with the theory that lay behind these activities. On the other hand, it has not developed their knowledge of the diversity of ways these new methods might be applied in the textiles industry nor has it developed their entrepreneurial skills. These skills are increasingly a vital dimension of modern work, since work in the textile industry increasingly involves the anticipation of customers' needs and knowing how to vary design, fabric or colour accordingly.

There is widespread agreement among all the stakeholders that the 'sandwich principle' which underpins Danish VET is still sound (Christensen, 1999). There is far less consensus, however, about how to achieve the broader and more connective forms of capability that apprentices require if they are to support their employability in their chosen vocational pathway, irrespective of whether they are working for an enterprise or are self-employed.

Historically, Denmark has always had a thriving textile industry based on close regional links between colleges and enterprises, but globalisation has undermined both the competitiveness of enterprises and the close relationship between the college and local textile companies. As a result, *Teknisk Skole Ishøj* (TSI) is trying to provide a flow of apprentices into textiles at a time when work experience is in short supply and often unavailable in the region where the college is situated.

5.2.3.3. *Rethinking the assumptions about learning*

One of the central theoretical presuppositions of current Danish VET policy is that VET should be more learner-centred. Thus, the idea of the individual basis of learning is consistent with the external conception of reform. However, by focusing on the management of the new arrangements for VET, for example, length, flexibility and combination of modules, policy inadvertently diverts attention away from pedagogical considerations.

TSI has, however, recognised the limitations of trying to reform VET policy without giving explicit consideration to the process of learning. The cornerstone of TSI's approach is to accept that the form and content of cognition are interdependent and that the process of learning will be more effective when learners are in constant interaction with 'a more experienced other' in the college, as much as in the workplace. For this reason, TSI has begun to identify a range of pedagogic practices which will help apprentices connect the theoretical knowledge taught in the college to the workplace and also to develop the dialogic skills that will support their learning in both contexts.

TSI is also facing two additional dilemmas. The first is that VET reform in Denmark has primarily focused on management arrangements; as a result, individual social partners are left to determine new learning arrangements. This situation can cause tensions since vocational schools and vocational factories may draw very different conclusions as to how to create the conditions that will assist learners in moving beyond the traditions of practice and having opportunities to explore the possibilities of practice. The second dilemma relates to the shortage of enterprises able to offer work experience to apprentices in the textile industry. This means that TSI has to identify how to enhance the practical experience of all apprentices while they are in college in case they are unable to undertake work experience in a textiles enterprise.

5.2.3.4. *Rethinking the practice of work experience*

The other main organising principle of the Danish VET curriculum is a commitment to modularisation. It is increasingly recognised throughout Europe that, unless implemented carefully, modularisation can result in fragmentation of course content and the learning process (Lasonen and Young, 1998). Rather than adopting the widespread practice of delivering a modular curriculum as a series of discrete and disconnected units, TSI has tried to develop an approach which reflects its philosophy that learning presupposes participation in social and cultural practice. For this reason, the school has chosen project work as the main strategy to deliver the new VET curriculum and a number of pedagogical practices have been developed to assist apprentices in mediating between the theoretical knowledge

taught in the school and everyday knowledge encountered in the workplace.

One of these practices involves apprentices designing projects which simulate the work process associated with different aspects of the textiles industry. By resituating these work processes in a vocational school, staff at TSI can help apprentices to overcome the inertness of the knowledge taught in the school and view it as a resource to support, for example, the design and manufacture of a new range of clothes. Another practice is to offer apprentices the opportunity to participate in different zones of proximal development when they are undertaking textile projects in the school.

Apprentices are, for example, encouraged to design a collection of clothes inspired by a particular historical period of film genre. One part of this practice of learning involves researching the history of art or film design to identify how the use of motifs and colour and/or aspects of film iconography could constitute the basis for a new collection. Another part of this practice of learning involves analysing psychological theories of human behaviour to persuade their tutors to implement a design and marketing strategy for their collection that will appeal to customers. A final practice is to research the ecological implications of the design and production process to ensure that the collection will not contribute unduly to pollution.

Taken in combination, participation in these different practices assists apprentices in mediating between different forms of theoretical knowledge which might otherwise not be appreciated as relevant to employment in the fashion industry and immediate practical concerns. This mediation relies on learners' dialogic capabilities, the mulling over of ideas and practices with one another and the resituation of ideas and practices in relation to new contexts and new products. It also enables tutors to alert learners to the value of searching for resources outside their immediate context in order to transform existing practice. Apprentices are alerted to the value of combining different fields of expertise in order to produce and market garments.

Staff at TSI have recognised that, although learning is a developmental process, not all apprentices feel confident enough to accept full responsibility for undertaking the type of project described above. For this reason, they have identified three different zones in which apprentices can work. Projects can be undertaken almost entirely on an independent basis and apprentices adopting this approach are expected to work collaboratively with one another and only receive feedback from their tutors when they are evaluating the outcome of the project. Another approach is to structure the design and delivery of projects to encourage apprentices to consult their tutors at every stage of the design and realisation of the project. This builds in opportunities for apprentices to extend the level at which they are capable

of working independently in a structured and supportive way. The third approach is to steer a middle course between the first two approaches.

The primary purpose of offering apprentices the opportunity to participate in a range of pedagogic practices when undertaking projects is to support their current stage of development and confidence in relation to project assignments. By not insisting that everyone participates in the same pedagogic practice, TSI can address policymakers' concerns to encourage a greater degree of self-management and self-direction amongst apprentices. TSI can also convey to apprentices that learning is a developmental process, which will have to be supported in different ways throughout their apprenticeship, according to the nature of the assignment in hand and the stage of mastery acquired. A further benefit is that apprentices are encouraged to accept that they and their teachers are members of a community of practice whose members can be called upon to support one another in different ways. In group evaluation sessions apprentices are encouraged to listen to one another's explanations of the rationale for their project design and the strategies they would employ to persuade business customers to buy their collection. This helps them to realise that technical skill, by itself, is insufficient to secure employability in the textiles industry.

5.2.3.5. *Rethinking the role of education and training provider*
The introduction of new pedagogic practices is still at a very early stage in TSI and they have not yet been fully evaluated. Nevertheless, the school is aware that the approach is generating certain tensions in the vocational factory and, to a lesser extent, in enterprises. If the factory is to consolidate learning practices – for example, encourage apprentices to mediate between the theoretical knowledge acquired through formal study and everyday knowledge acquired through participating in communities of practice – it is likely that a number of changes will have to be made to work design and work roles. One of the challenges for the factory will be to reconfigure the work tasks offered to apprentices so that they develop less occupation-specific skills and more future-oriented skills to support their employability in a highly competitive industry. To achieve this objective will involve changes in the style of working by trainers with apprentices. Trainers' pedagogic practices are still firmly rooted in a belief that skill is not only a form of personal property, which can only be acquired by apprentices after a long period of occupational socialisation, but is also occupationally specific. Trainers are only gradually beginning to recognise the situated and dialogic basis of skill formation and hence the need to rethink the practices they employ to help apprentices learn in the workplace.

In contrast, enterprises in the textiles industry are beginning to appreciate that, if they are to work in partnership with schools, such as TSI, to support apprentices in acquiring future-oriented skills, they will have to rethink how they can help develop such skills. One of the strategies which local theatres are employing is to place orders with TSI for the costumes they require for their future productions, rather than hosting one or two apprentices in their costume departments. This has a number of advantages. First, TSI can offer all apprentices the opportunity to produce clothes to very demanding commercial specifications. Second, apprentices have the opportunity to use the forms of higher order knowledge and skill with which they have acquired through their project work.

5.2.4. German illustration of system innovation: Geschäfts - und Arbeitsprozessbezogene Ausbildung in ausgewählten Industrieberufen mit optionaler Fachhochschulreife (GAB)

A pilot project in cooperation with schools, an enterprise and the ITB, University of Bremen.

5.2.4.1. *Context*

The rapid change in the content and the organisation of industrial work throughout Germany over the last decade has generated considerable concern. This relates both to the future of the dual system itself and to specific features, such as the need for new learning processes to support apprentices in acquiring more future-oriented skills though the system (Heidegger and Rauner, 1996; Bremer, 2000). The analysis here focuses upon the second issue.

The first problem is that many of the vocational profiles (recognised training occupations) which informed the design of work roles and vocational training in different industrial sectors have become obsolete. They are now either too narrow or are based on traditional boundaries between work roles which no longer apply following the reorganisation of production, marketing and distribution in most industries. The second problem is that the constant redesign of work, along with the widespread deployment of ICT in workplaces, has undermined the original guiding principles of the structure and content of vocational curricula in the dual system. In the past, vocational programmes approached skill training at a rather abstract level: skills were taught with only a very general link to the work situation where they had to be applied. Furthermore, the sequence of curricula was based on a principle of progression, mastering relatively easy skills followed by increasingly difficult ones. Apprentices are, however, increasingly called upon to undertake work tasks which involve a combination of easy and difficult

elements and this cuts across traditional vocational profiles and pedagogic processes. For this reason, the existing form of preparation is thought to be no longer adequate (Bremer, 2000; Heisse, 2000). Moreover, apprentices now have to be prepared to respond intelligently and creatively to workplace problems and continue to learn throughout their working life.

Another problem relates to the organisation of training. Historically, this took place predominantly in specialist workshops, environments where theoretical knowledge and skill were taught with little reference to the actual problems and challenges which arose in the work process.

In an attempt to identify how to help bridge the gap between highly systematised and abstract vocational training and the demands of modern workplaces, a series of pilot projects in different industrial sectors were initiated to address the challenges facing the dual system. They reflect a demand for a much closer relationship between the situatedness of work process knowledge and the knowledge taught in training schools (EERJ, 2003). They also reflect the demand for the type of future-oriented skills which facilitate the application of knowledge in the workplace and promote the flexibility to deal with new and unforeseen situations as well as promoting continuous learning. These pilot projects have been funded nationally through the *Modellversuch* programme and have received additional financial contributions from participating enterprises. Their primary aim is to review and revise occupational profiles, reform the structure and content of the curriculum and rethink the organisation of training. The illustration provided below illustrates the extent and scope of the innovations being piloted in the automobile industry. The partners in this specific project are Volkswagen, Institut Technik und Bildung (University of Bremen) and a number of vocational schools.

5.2.4.2. *Rethinking the purpose of work experience*
Traditionally, the primary aim of apprenticeship in the dual system has been to prepare apprentices for employment within a highly specialised, but rather narrow, framework of vocational profiles. In the case of the automobile industry, apprentices were prepared for one of 29 different work roles. The social partners have come together to establish the GAB project to ensure that apprentices can make broader contributions to managing a greater range of work processes. The project seeks to identify how the work process knowledge needed to operate effectively in the reengineered automobile industry can be effectively imparted in vocational schools and the workplace.

Educators have had to rethink the purpose of work experience, asking themselves how work experience can support apprentices to meet the new

knowledge and skill needs of enterprises? They accept that the dual system will have to support apprentices more explicitly in learning how to see the wider purpose between activities where learning is not the primary objective (i.e. managing contributions to work processes, work teams, etc.) and to activities where learning (i.e. developing work process knowledge) is the primary objective.

This new emphasis demands that educators and enterprises adopt a much more reflexive stance towards the relationship between vocational education and work. Rather than seeing them as separate and disconnected activities, and assuming that the responsibility for assisting apprentices to connect codified knowledge to the practical demands of the workplace lies with a *Meister*, educators involved with the GAB project are gradually recognising that work and vocational education and training are integral elements of a unified learning process (Heisse, 2000). Reconceptualising the relationship between work and vocational education along these lines, however, raises a number of issues about the pedagogy of work experience.

5.2.4.3. *Rethinking assumptions about learning and development*
It has long been accepted that the primary aim of work experience in the dual system was to socialise apprentices into a particular occupational culture. Hence, learning and development were chiefly viewed as a process of inculcating occupational attitudes and habits as much as acquiring work-related knowledge and skill. The growing interest in the concept of work process knowledge over the last ten years has led many educators to the view this conception of learning through apprenticeship as inadequate (Fischer, 2001). It overlooked how apprentices developed the knowledge and skill to respond to the 'manufactured uncertainty' (Giddens, 1991) engendered by globalisation and the widespread diffusion of ICT throughout industrial sectors.

Building on the insights provided by researchers involved with the work process knowledge project (Boreham and Fischer, 2002), GAB educators have adopted a more explicitly developmental conception of learning and cognition for the pilot project. They have introduced a more textured approach by viewing learning and development as a process not only of moving through a series of stages from novice to expert, but also of gaining experience of responding to combinations of easy and difficult elements throughout each stage of this process. By drawing attention to the complexity of stages of development, the GAB Project has alerted educators to the importance of distinguishing carefully between the type of and design of vocational tasks (Bremer, 2000) which might support each stage of development. This shift in

thinking has led to a fundamental reappraisal of the activities undertaken in the formal training component of apprenticeship and in the workplace.

5.2.4.4. *Rethinking the practice of work experience*
The GAB Project has introduced a number of changes into the structure of apprenticeship in vocational schools as well as in the workplace.

To begin, a new range of vocational tasks has been devised, in consultation with Volkswagen, in vocational schools along with new learning processes and methods of assessment. This has involved trainers in vocational schools in planning, organising and conducting formal instruction in accordance with the new GAB philosophy of supporting apprentices to develop occupational capabilities (e.g. forms of technical knowledge and skill required to fulfil specific tasks) and organisational capabilities (e.g. generic forms of knowledge and skill to manage work processes). Apprentices are introduced to a variety of problems that can occur in design, production, marketing and distribution and are encouraged to identify why these problems occurred, how they could be resolved and what actions could be taken to ensure they do not arise again. Another development has been the establishment of a small number of service/production learning areas in the factory, which are referred to as 'hot islands' (i.e. specific work locations) in an attempt to provide a link with the demands of production. The main idea behind the introduction of the learning areas is that the factory will commission the apprentices to produce a range of products/services. This will assist apprentices either in developing the skills required on the production line or in experiencing the pressure of completing an assignment to a deadline. Thus, the learning area provides a safe zone of proximal development where apprentices can learn from their individual and collective successes and failures.

Finally, the period of internship has been extended significantly. This allows apprentices to become familiar with the nature and challenge of work in the production and service departments in relation to timeframes, deadlines, etc. and to develop a wider repertoire of skills at an earlier stage in their development.

5.2.4.5. *Rethinking the role of education and training providers*
In the past, the dual system, rather like the Danish system of apprenticeship, had been characterised by a form of insular specialisation (Young, 1998). One of the priorities of the GAB project has been to involve the social partners in a process of continuing review.

Starting from first principles, the GAB project has fundamentally reassessed occupational profiles in the automobile industry. The review involved senior

Volkswagen managers and expert workers, as well as educators from ITB, University of Bremen, producing a range of 'scenarios' about the future design and organisation of work and skill. Now, only five, instead of 29, profiles are used in the automobile industry. These profiles spell out the occupational capabilities (e.g. forms of technical knowledge and skill required to fulfil specific tasks) and organisational capabilities (e.g. generic forms of knowledge and skill to manage work processes) which apprentices are expected to develop.

The next step was to consider how to rework the curriculum in vocational schools so that vocational tasks, the learning processes and methods of assessment specifically support apprentices in gaining the broader skills contained in the new occupational profiles. Supporting apprentices to develop these capabilities requires a subtle but significant shift in the role of *Meisters* who work in the learning areas and in the purpose and nature of assessment within the dual system. Instead of viewing skill as their personal property, which can only be acquired by apprentices after a long period of occupational socialisation, *Meisters* in the GAB project have to develop a more situated perspective about the basis of skill. This involves providing apprentices with opportunities to participate more swiftly in existing work practices and also to help them to glimpse how those practices might have to change in future.

This development has involved *Meisters* in new forms of activity. They have had to work with vocational trainers to identify new pedagogic practices to assist apprentices in enquiring about the work process and sharing the knowledge they develop with other members of their community of practice. It has also involved vocational trainers devising a new range of assessments to assist in identifying the extent to which apprentices are developing necessary occupational and organisational capability.

5.2.4.6. *Rethinking the outcome of work experience*
Traditionally, the main outcome of work experience in the dual system has been membership of a fixed and stable occupational community of practice, which has been well served by both the bridge and work process models of work experience. The emerging messages from the GAB project indicate that this is now an inadequate conception of the outcome of work experience. The project is, however, still coming to terms with how to overcome the legacy of insular specialisation within the dual system. All the social partners are striving to make their respective contribution more connected in order to contribute effectively to the overall objective of developing the skills and capabilities called for by the new vocational profiles (Fischer, 2001). The social partners are responding to this challenge with a growing awareness of

the need to support apprentices to learn through work experience. At present, this is taking the form of ensuring greater connectedness between vocational schools and enterprises.

5.2.5. Swedish illustration of local innovation: Konsumentföreningen Stockholm Gymnasium (KSG)

5.2.5.1. *Context*
Until the 1970s, academic and vocational education in Sweden were separate and distinctly different systems of education. In the late 1970s, however, in an attempt to create parity of esteem between the two systems, academic and vocational education were reorganised into a single, unified system of upper secondary education (16-19 years of age) (Madsén and Wallentin, 1998). Since that time, learners, irrespective of which pathway they chose to pursue, have attended the same educational institution.

Work experience has always been an integral part of vocational education and training (VET) in Sweden, reflecting the original connection between VET and apprenticeship in the craft and technical-based industries. As part of its integration into upper secondary education, the vocational pathway was subject to a series of reforms throughout the 1980s; a development that resulted in learners being offered a broader and less occupationally-specific form of vocational preparation. One feature was that the purpose of work experience changed significantly, serving the broader purposes of promoting learners' economic and industrial awareness, their personal development and the fostering of generic skills.

Policymakers extended work experience into the academic pathway in the mid 1980s through a series of pilot programmes. It was made a compulsory feature of the academic pathway in 1999, although the proportion of time allocated differed from the time allocated to it in the vocational pathway. The new legislation established local educational programme boards to provide a forum for the social partners to harmonise national and local educational priorities and to agree the pedagogic philosophy adopted by each school. One result of this development has been that each school has relative autonomy when it comes to determining the overarching purpose and pedagogy of their programme of work experience. This enables all schools, even those established by private organisations, such as the consumers' cooperative society (CCS) of Stockholm, to develop and pilot new approaches to work experience that reflect the interests of teachers, employers and learners.

5.2.5.2. *Rethinking the purpose of work experience*

The *Konsumentföreningen Stockholm Gymnasium* (KSG) was established by the CCS in 1995 to provide an opportunity to specialise in business administration and economics. The school offers two programmes of study: an academic qualification that supports entry into higher education and a vocational qualification that supports entry either into higher education or the labour market. Irrespective of the pathway chosen, KSG ensures that all students have access to a work experience programme in the first two years of their upper secondary education.

KGS has never assumed that school-based components of work experience provide learners with some form of context-free knowledge that is applicable to any work situation, nor that the work-based components of work experience programmes mould students' attitudes and skills in the workplace. From the outset, KSG has attempted to adopt a much more reflexive view of the relationship between school and work, recognising that school and work offer different types of learning experiences and learning resources and that the pedagogic challenge is to identify how the school-based and work-based components can be structured so that they constitute a meaningful experience for learners.

5.2.5.3. *Rethinking assumptions about learning and development*

Viewing learning and working reflexively has meant KSG accepting that the purpose of the social and cultural practices of school and work-based learning differs from one context to another. In school learning, participation in practices such as understanding the principles of business economics in the retail sector, has to develop students' capability to mediate their understanding of experiences encountered during work-based projects and to resituate theoretical knowledge to support participation in workplace practice.

One of the difficulties in assisting learners to develop these capabilities lies in overcoming the tension between theoretical and everyday knowledge. This is not straightforward because it is not always easy to identify how kernel concepts inform work design: such knowledge is deeply embedded in workplace practices and routines and hence distributed in very uneven ways. In addition, workplace learning occurs when learners participate in practices whose primary purpose is to support production and not to enhance learning. This means that learners can experience difficulties when trying to identify how everyday experience can be used to interrogate the efficacy of the knowledge acquired in school. The existence of this tension implies that educators have to be prepared to revise the content of the curriculum as well

as their teaching methods as learners become aware of the difficulties associated with boundary crossing and resituating codified knowledge in the ways described above.

5.2.5.4. *Rethinking the practice of learning through work experience*
At present, teachers in KSG work collaboratively to develop new pedagogic practices to support learners in mediating between school and workplace knowledge. They are approaching this challenge in a number of ways. In the first place, KSG has redesigned its curriculum so that when learners are in school, approximately half the week is devoted to instruction in core subject areas and half the week is given over to project work. On the one hand, this means that KSG offers formal instruction in the following fields: business economics, marketing, commerce and accounting. Having provided learners with access to a range of the kernel concepts (supply and demand, double accounting, etc) associated with the above fields, learners are then encouraged in their project work to begin to formulate their own generalisations about the world of work. On the other hand, the allocation of time for project work allows learners collectively to develop projects with their teachers, enabling them to investigate specific aspects of business practice which relate to their theoretical study. Project work provides a number of opportunities for learners to consolidate their understanding of the kernel concepts and to use them to mediate their relationship with the world of work.

There are several advantages in adopting the kernel concept method. It provides a framework to assist learners to analyse the relationships between different fields of knowledge (e.g. marketing, production and distribution) and the different activities associated with those fields. It can also be used to support learners in analysing the organisation of work in specific enterprises in the retail industry. Finally, based on the combination of the above activities, learners can start to identify the practical problems that may cause tensions in production, marketing or distribution, and possibly undermining the competitiveness of these enterprises in the global economy. Written assignments are used to help them work collaboratively to model alternative solutions to these problems. The implications of these solutions are then discussed with representatives from the retail industry. This assists learners in envisaging the problems they would be likely to encounter when implementing the different solutions proposed.

KSG is also developing the practice of learning through work experience by supporting learners to undertake a range of consequential transitions. Learners begin by shadowing a manager of one of the CCS companies, allowing them to develop an initial understanding of some of the theoretical

principles and the language of business with which they have become acquainted in school. They also begin to identify some of the social and cultural practices in which they will be expected to participate when they undertake their work experience. Learners subsequently move on in their second year to undertake periods of work experience in CCS companies in Stockholm. This stepped approach allows learners gradually to consolidate their ability to conduct dialogic enquiries in the workplace: they start in the work shadowing phase by asking factual questions and move on to more analytical questions when they participate in their first period of work experience.

Recognising that work experience is a social, cultural and dialogic process involving the use of 'mediating artefacts', the school encourages learners to consider how the symbolic concepts and material tools (e.g. computers) (Daniels, 2002) which they might encounter either in school or in the workplace can support their learning. Ideas, such as delayered organisations or continuous improvement are used by learners to help them mediate between theoretical accounts of business and organisational change and the actual manifestations of those changes encountered when undertaking work experience. Teachers support this process of mediation in a number of ways. They convene meetings to help learners mull over the significance of, and relationship between, concepts and the world of work. They trace the mismatches between theoretical and everyday knowledge and between 'espoused' practice and 'everyday' practice. These pedagogic strategies assist learners in appreciating that work experience is an initiation into a medium that already embodies a range of conflicting conceptual relationships and that the meaning and significance of work depends not only on the experience as such but also on how and by whom it is interpreted.

Material tools, such as computers, are used in two main ways: in school for communicating and sharing their developing sense of the world of work with one another and their teachers; or in analysing the implications of new technology in the workplace. The former can involve learners circulating emerging ideas or draft assignments for comment and using e-mail systems to contact professionals outside school for practical advice and assistance with assignments. This pattern of working allows students to develop the social and cultural practices associated with enquiry-based learning, irrespective of whether it is occurring in school or in the workplace. The latter allows them to resituate their knowledge of the changing relationship between work and technology by, for example, identifying the extent to which workplaces are using new technology to extend or restrict knowledge flows within organisations or to enhance or diminish work roles.

5.2.5.5. *Role of education and training provider*
KSG has radically restructured its learning environment and profoundly transformed the learning experiences offered to students. In the case of the former, a series of workrooms has been created with Internet connections, providing teachers and learners with a single base for periods of formal instruction and project work. In the case of the latter, learners are encouraged to think of themselves within communities of practice or communities of enquiry and to work collaboratively to address common educational concerns, rather than to view themselves simply as individuals undertaking a range of courses. The school reinforces this sense of community in a variety of ways. It places high demands on learners. They are encouraged to keep agreed deadlines and meet certain expectations and standards in their life inside the school. It also encourages learners to view the process of learning as a process of boundary crossing between internal and external communities. Learners are encouraged to seek specialist advice and support either from another teacher who is not a member of their project team or from outside experts. This process involves them in learning how to formulate questions so that they can extend their understanding of particular issues or develop their practical skills beyond their current level of performance.

5.2.5.6. *Rethinking the outcome of work experience*
By providing opportunities for learners to participate in a range of social and cultural practices, KSG is gradually enabling them to appreciate that mastery of a particular practice is not always possible through simple participation in that practice alone. Participating in formal education, for example, may enable learners to develop certain capabilities that help them to master the practices of the retail industry. In this sense, the school is starting to shift away from the practices associated with the experiential model of work experience towards practices associated with the connective model.

One of the issues that KSG is still addressing is how to ensure that learners do not develop an overattachment to specific forms of social practice and fail to see the relevance of others. Business development in the retail industry is constantly influenced by developments in other industries. One of the main challenges associated with the connective model of work experience lies in supporting learners to differentiate between the types and relevance of knowledge and practice associated with different communities and to recognise that the process of learning involves connecting different forms of expertise to produce new knowledge.

5.2.6. UK illustration of local innovation: East Berkshire College of Further Education and Legoland

5.2.6.1. *Context*

Further education (FE) colleges in the UK offer a wide range of academic and vocational courses. Work experience is not a compulsory feature for either pathway with the result that learners can, in theory, acquire a vocational qualification without having had access to a workplace. FE colleges have a high degree of autonomy in the organisation of academic and vocational programmes and this has led the media faculty at East Berkshire College among others offering advanced vocational qualifications (AVQs), to introduce work experience as a core component of media courses. This commitment to work experience has led the media faculty to identify business partners who are prepared to work with them and host planned programmes of work experience. One of these business partners is Legoland.

5.2.6.2. *Rethinking the purpose of work experience*

An advantage of work experience not being a compulsory component of the AVQ has meant that the media faculty, in discussion with Legoland, has been able to agree the aims of the partnership as well as determine the pedagogic philosophy. In the case of the former, both parties have agreed that work experience should provide AVQ media students with the opportunity to:

(a) develop their skills as journalists as well as their practical media-based skills;

(b) provide students with an insight into the ever-increasing application of media-based knowledge and skill within modern workplaces;

(c) to develop the capabilities of students to work in different organisational contexts (i.e. as boundary-crossers).

Both parties have accepted that learning is a social and cultural process that occurs in different communities of practice. The learning practices in the college and on the Legoland site reflect this.

One of the disadvantages of work experience not being a compulsory component of the AVQ, however, is that the media faculty does not have access to a network of experts to support them to integrate work experience more effectively into their media programme. For this reason, the faculty has had to identify educational partners who could help them research issues connected with learning at work and support them in developing appropriate pedagogic practices.

5.2.6.3. *Rethinking the assumptions of learning*

The media faculty realised, when setting up their programme, that existing approaches to work experience in the UK were inadequate. The faculty wanted to avoid conveying the impression to learners that the worlds of work and education were intrinsically different. They were also keen to base work experience on pedagogic practices that would enable learners to resituate knowledge and, in the process, begin to produce new knowledge. Based on the experience of some members of staff who had worked in the industry, the media faculty recognised that it is not work experience *per se*, that will motivate young people to develop work-related skills and overcome the inert nature of what is taught in the college. Rather, it is the nature of the communities of practice in which both the problems and the interpretations of the learner are embedded that determines whether learners are able to generalise from their work experience.

5.2.6.4. *Rethinking the practice of work experience*

The work experience established by the media faculty and Legoland involved media AVQ students producing Legoland's monthly staff newsletter. The programme recurs throughout the year, allowing different groups of AVQ media students to produce a different newsletter. Working on the Legoland site involves students developing their skills as journalists, talking to staff at all levels, identifying possible human-interest storylines and writing all the copy. Producing the newsletter means that students have to learn how to work within Legoland's corporate design guidelines on the final layout. They also have to learn how to liaise with the College's information and communication technology unit to plan production. Thus, there were two levels of activity where learners could begin to innovate in order to retain the interest of readers. They could vary the types of articles included and they could vary the layout.

One of the advantages of the rotation arrangements is that a significant proportion of the AVQ media group was able to experience some form of consequential transition. By continually crossing the boundary between school and college, learners have to take responsibility for varying their performance between two constantly evolving work contexts. Developing this level of maturity can sometimes be quite painful. Some students report that it is much more daunting when Legoland's staff point out the limitations of their work (e.g. in relation to the content and layout of the newsletter) than it is when college staff make similar observations. The media faculty has realised that, although the zone of proximal development which characterises the student-teacher relationship can be fraught with tensions, it still provides a space where students can fail since it is accepted that their

identity and expertise are constantly changing and developing. In contrast, once students enter Legoland, they are subject to the demands that the company would place upon full-time staff and thus perceive that they are no longer in the comfort zone of failing honourably.

The media faculty has developed a range of pedagogic practices to help learners to apply the theoretical concepts and the technical skills acquired during the formal component of their AVQ programme. For example, editorial meetings are convened where learners draw on their understanding of concepts such as target audience, register and tone and sequencing of storylines, to explain why and how their draft copy is comparable to copy produced by a professional journalist. Learners are encouraged to mediate between the different forms of knowledge acquired in college and at Legoland – the production of the newsletter being an example of the diversity of knowledge and practice required in workplaces. On the one hand, they are called upon to use formal learning to address many of the practical problems they encounter in producing the newsletter and, on the other, to generalise about how their experience might provide ideas to tackle future problems.

Finally, working at Legoland places learners in a position where they have to accept responsibility for their own actions as well as for the decisions they make when contributing to the production of the newsletter. In order to gain maximum benefit from the work experience, students have to demonstrate that they can respond positively to feedback about the need to redraft their own text or to amend their layouts in order to improve the quality of the newsletter. In this sense, they are modelling aspects of the practices associated with the role of learner and trainee journalist.

Taken in combination, staff from the media faculty feel that these pedagogic practices, which entail a complex interplay between the learners' performance and the environment for learning created by the media faculty and Legoland, support learners in looking beyond current practice and help them shape future actions. Furthermore, the focus on the production of a newsletter means that learners have to learn how to use effectively the learning resources (i.e. mediating artefacts) which are distributed across two sites and which help to structure their learning.

5.2.6.5. *Rethinking the role of education and training providers*
Achieving the level of self-development and personal autonomy described above does not simply come about through learners' developing their capacity for autonomous self-directed learning or learning-by-doing. Staff at Legoland and the college have to collaborate to provide a supportive context. One important element of this environment is ensuring that learners have access to

a 'learning curriculum' (Lave and Wenger, 1991), in other words, access to those resources (such as people, dialogue, networks, technology) that are an invaluable part of learners' becoming effective members of a community of practice, capable of developing greater degrees of independence.

Unless learners have access to a learning curriculum, it is very difficult for them to develop the capability to use the college and Legoland as dual sites (i.e. contexts) for learning. The opportunity to research, write and design an authentic media product not only provides them with an effective simulation of the conditions they are likely to encounter in full-time employment, but it also enables them to socialise with a diverse range of Legoland employees and thus enrich their grasp of the changing and uncertain nature of the practice of media work. In this sense, the actual experience of producing an authentic media product helps students to develop work process knowledge.

5.2.6.6. *Rethinking the outcome of work experience*

Moving from an experiential model and adopting a more reflexive stance towards the relationship between work experience and formal study, set different challenges for educational institutions, companies and the students themselves.

Legoland had to ensure that staff who were supporting boundary crossing activities were setting challenging, but not unachievable, tasks, encouraging learners to ask questions about work practices and giving them constructive feedback about their performance. This, in turn, involved Legoland's own line managers in accepting responsibility for creating an environment in which their staff could enhance the learning process by helping students participate effectively in different organisational communities of practice.

The media faculty had to be prepared to interrogate its own work practices by responding positively to feedback from students about perceived deficiencies in the design and delivery of the college components of the work experience. This ultimately led the faculty to rethink the relationship between learning practices designed to support sequential learning (i.e. aspects of practice) and those designed to support conceptual learning (i.e. focusing on the relationship between practice and context). For example, the media faculty modified the delivery of certain course units to ensure that key parts of the programme were introduced before the students undertook work experience. They also broadened the focus of tutorials to consolidate the link between different types of learning to ensure that core skill development was monitored and evidence of attainment recorded in the students' records of achievement. Also, the media faculty is still coming to terms with the challenge of assisting learners to resituate knowledge and skill.

5.3. Concluding comments

The innovations in practice described above are all responses to the impact of global economic and technological changes. There are tensions arising from the demand in enterprises for new types of generic skills in the knowledge economy and in apprenticeship and school-based systems because of a need to rethink the purpose and assumptions about learning and the outcomes of work experience.

The defining feature of such responses is that they are concerned with innovations in pedagogy. However, these take very different forms.

In the case of the apprenticeship-based systems, it is evident that the social partners have committed themselves to reforming the purpose, management and outcomes of work experience as well as the role of education and training providers. However, tensions appear to have emerged as a result of the social partners attempting to change learning practices without necessarily rethinking their assumptions about what it means to learn through work experience in the context of a knowledge economy. We suggest that the next innovation stage may be fruitfully explored with the help of the connective model. It offers new criteria for assessing progress that are at the heart of the Danish and German reforms. This may also assist the social partners to embed the reforms more widely within the VET systems.

In contrast, the innovative responses that we have identified in general education, illustrate the advantages of having relative autonomy to take the initiative and reform practice at local level. Not having to renegotiate roles and responsibilities with the social partners, the respective Swedish and UK educational institutions have been able to choose a different starting point. They have focused on reconceptualising pedagogic and management practice. Nevertheless, certain tensions are emerging as they try to develop a new approach to learning through work experience. For this reason, we also suggest that the categories and criteria of the connective model, including the practices of learning, may assist them in identifying the next stage of development of their work experience programmes.

Conclusions: issues for research, policy and practice

This book has been concerned with breaking new ground in understanding the purpose of work experience in vocational and general education and identifying the practices which facilitate learning through that medium.

We have argued that one of the limitations of the macrosystemic approach to innovation in education and training systems (Kämäräinen, 2002a), an approach which has characterised much of the reform process in Europe, has been a lack of attention to the question of how individuals actually learn through work experience. This approach arises primarily from a focus on structural and institutional reorientation which, while important, ultimately marginalises a consideration of learning and pedagogy. This book has argued that, unless there is rethinking about what it means to learn through work experience, educators will be bereft of new conceptual resources for the critical interrogation of existing institutional arrangements and pedagogic practice in different countries and systems. We have also argued that the widespread interest in Europe and elsewhere in the world in teaching and assessing generic competences within the framework of key qualifications (Billet, 2003; Kämäräinen et al., 2002b) is well intentioned but ultimately insufficient.

As our typology of generic skill (see Figure 1 in Section 1.4) has highlighted, when policymakers use the term generic skill they tend to assume that skill is the property of an individual. They overlook the relational basis of skill. In other words, they ignore that the development and demonstration of skill is shaped by the opportunities to participate in, and interrogate, different social practices or activity systems. Policymakers tend not to distinguish between the type of skill developed through participation in routine as opposed to novel situations; the dominant assumption is normally that skill development occurs through providing young people with an experience of work.

One of the problems with this view is that participatory practices are those that the social institutions (e.g. schools of vocational or general education, workplaces) can 'afford' the individual at the point of the development of skill and when it comes to the demonstration of skill (Billett, 2003). Individuals will determine the extent to which they engage in specific practices; the material point, however, is that what they learn through their engagement is

historically and culturally situated. We have pointed out two educational challenges in preparing young people to work and learn in the European knowledge economy. The first is to help them to develop generic skills in context-specific situations and the second is to design a curriculum that supports them in connecting the learning which takes place in education to the learning which takes place in the workplace. We argue that what we have referred to as the practices of learning through work experience provide a way of addressing these issues.

These ideas need not be explored at an abstract level only. Nor need they, nor should they, be remote from the reality of work experience programmes in vocational and general education. With this in mind, we are concerned to demonstrate their implications for innovation in practice in work experience, and hence for knowledge development in relation to work-related learning. We attempt to elucidate the value of these ideas and suggestions for 'micro and macro systemic' innovation (Kämäräinen, 2002a). This form of pedagogic innovation spurs the introduction of new strategies which facilitate the reshaping of environments for learning, the redesign of curricula and the reorganisation of learning practices. Unless account is taken of such innovation, any changes at the macrosystemic level to address new issues about skill development through work experience will remain predicated upon old models of learning through work experience.

6.1. Implications of innovation in work experience

6.1.1. Implications of the kernel concept for curriculum design

The kernel concept constitutes an invaluable resource in rethinking how curricula can support learners to relate theoretical and everyday knowledge. Our use of the concept introduces a new principle for the design of curricula, which is consistent with the interest in vocational and general education, through recognising the socially located nature of knowledge and the need for dialogue between educators and learners about the purpose and process of learning.

The illustrations in Chapter 5 show that, insofar as schools are redesigning curricula to support learners in developing a more connective perspective of the relationship between theoretical and everyday knowledge, the approaches they adopt have many affinities with the kernel concept.

The Danish illustration highlighted how the desire of the vocational school to assist learners in formulating a theoretical relationship with the everyday world of the textiles industry had to be supported by the introduction of new

learning and teaching practices. Instead of continuing the long-standing vocational tradition of presenting apprentices primarily with a range of 'drill and practice' activities, the vocational school had introduced new pedagogic practices to help apprentices grasp the connections between different types of knowledge and the social practices in which they are embedded. One of those strategies – project work – had been specifically designed to assist apprentices to understand the relationship between theoretical and everyday knowledge, helping them to draw on a wide range of both forms of knowledge as a resource for designing, producing and marketing a new clothes collection. This allowed apprentices to develop a more connective understanding of the traditions and possibilities of practice.

In contrast, the German illustration of a pilot project in the dual system offers a rather different point of engagement with the kernel concept as an organising principle for reforming curricula. Here the social partners devised a new range of vocational tasks in an attempt to support apprentices in developing a more holistic understanding of work process in the automobile industry and in acquiring a broader range of skills. One of the main features of this new approach to learning was to introduce apprentices to a variety of problems that could occur in design, production, marketing and distribution to help them identify why these problems occurred, how they could be resolved and what actions could be taken to ensure that the problems did not arise again. One of the unanticipated outcomes of the introduction of the new vocational tasks was that it alerted educators to the importance of providing apprentices with an opportunity to resituate their new knowledge and skill in the context of an automobile factory. We return to the significance of this later on.

In both the Danish and German cases, the current problem that educators were struggling to overcome was the perceived limitation of the 'empirical' curriculum tradition, which tends to view theoretical and everyday knowledge as being separate and unrelated. There is some evidence that educators are gradually appreciating that, if apprentices are to connect different forms of knowledge, this requires new pedagogic practices that have connectivity as their primary goal, even though educators may not describe them in those terms.

One of the challenges for future development, as the Danish illustration reveals, is to give sufficient thought to how to respond to the developing needs of apprentices by not assuming that one common pedagogic approach will suit all. In an attempt to address this issue, the Danish vocational school had built in a range of opportunities (zones of proximal development) for apprentices to extend the level at which they were capable of working with 'more experienced others' to acquire and resituate knowledge and skill.

Another challenge for future development, as the German illustration indicates, is the importance of reappraising what is meant by vocational knowledge rather than simply proceeding to modularise an existing curriculum.

6.1.2. The implications of dialogic enquiry for learning at work

This book argues that mediating and resituating theoretical and everyday knowledge presupposes that learners are as confident about using language to grasp theoretical concepts as they are in using everyday knowledge to understand and critically interrogate the everyday world of, for example, the textiles or automobile industry and the educational world of the school. Yet the critically important role of language in assisting learners to master work activities and to put those activities into their broader context is frequently overlooked in discussions about work experience.

To overcome this, educators are faced with the challenge of helping learners use language to grasp the relationship between abstract and concrete aspects of social practice. It is evident from the Swedish and UK illustrations that there are many considerations to take into account if learners are to be supported successfully to grasp such relationships.

While not familiar with the central tenets of activity theory, the Swedish school recognised from the outset that learning through work experience is a social, cultural and dialogic process which can be supported through the use of mediating artefacts. Having devised pedagogic practices to assist learners in formulating a relationship between theoretical knowledge taught in school and the everyday knowledge of the retail industry, the school set learners a range of assignments to help them to interrogate the value of the concepts for understanding the diversity of business practice. Learners were able to take the theory of, for example, supply and demand or delayered organisations, into their actual experiences of business and organisational changes in their work experience. They were also encouraged to contact representatives from the retail industry to enquire about specific aspects of business practice that were of concern to them.

The Swedish school's approach to supporting learning through work experience has progressed beyond the approach of treating learning in school and learning at work as separate and distinctively different forms of learning. Educators appreciated that some interrelated issues had to be addressed simultaneously: assisting learners to conduct dialogic enquiries in and about workplaces concerning the value of theory as a resource for understanding practice, and supporting the outcome of these forms of dialogic enquiry in schools by providing opportunities to help learners mull over the significance of, and relationship between, theoretical and everyday knowledge.

The UK illustration offers a different perspective on how to assist learners in coming to terms with the relationship between theoretical and everyday knowledge and experience. By directly involving media students in the production of Legoland's monthly staff newsletter, the UK college provides learners with an opportunity to participate in, and critically reflect upon, a range of practices involving the use of different specialist languages. Learners are immersed in the multiple discourses of the workplace by regularly visiting Legoland and talking to staff about their work in order to identify possible storylines for inclusion in the newsletter. Undertaking both these activities enables learners to appreciate how to use the theoretical language of media studies (for example, audience) to reinterpret experience so that it constitutes a good story according to the criteria of current journalistic practice. Producing the newsletter also enables learners to mediate the tensions that arise between having to operate within Legoland's corporate layout and the challenge of designing the newsletter in a creative and self-satisfying way.

A critical learning point arising from the UK case study is that educators have realised that, taken in combination, both activities enable learners to grasp the strengths and limitations of the relationships that inform and shape work on the Legoland site and within the college. Once the significance of this focus on activity has been grasped, educators are able to assist learners in connecting different types of knowledge and learning.

6.1.3. **The practice of boundary crossing and consequential transition**

We have drawn on activity theory to provide important but usually unacknowledged insights into the challenges faced by young people undertaking work experience in learning how to cross the social and cultural borders between education and work. This transition is particularly daunting for several reasons. Unlike learning in formal settings, where the goals of learning are clearly set out, boundary crossing means that the zone of proximal development is far less clearly demarcated. This is partly because learning in workplaces consists chiefly of undertaking actions which are embedded in activities whose formal object and motive is not learning as defined and understood in general and vocational education. It is also because moving between the context of education and work involves changes in identity as much as the acquisition of knowledge and skill. Another reason is that boundary crossing can result in learners encountering the contradictions in activity systems which may hinder their learning.

The first step in understanding what boundary crossing entails pedagogically had been grasped by the Swedish school in anticipating that

it is necessary to devise a range of pedagogic practices to support learners in a range of consequential transitions. All learners shadow a manager in the retail sector before they participate in work experience in the same sector. This careful combination of transitions allows learners to develop an initial understanding of the relationship between theoretical knowledge and everyday experiences. Moreover, it provides a structured framework which gradually enables them to become members of different organisational communities of practice, developing the ability to manage work processes and contribute to the performance of the enterprise.

The UK college addressed the issue of transition in a slightly different way. Here, learners are actively involved in making a number of simultaneous transitions between the college and Legoland, each transition serving quite different purposes. Sometimes it is to support – through dialogic enquiry – the production of the newsletter; on other occasions, it is to reflect on what they have learnt. By being forced to take responsibility for varying their performance between two constantly evolving work contexts, the college places considerable demands on learners. This can sometimes be quite painful for learners since they find it easier to accept criticism of their work in a school context than in the workplace.

The pedagogic approach adopted by the UK college raises critically important issues about how to support learners in zones of development which the college has not designed and cannot control. The experience of the UK college indicates that the focus of learning has to fall on the relationships in the activity system, not just on the individual elements of that system. This experience also indicates that extensive discussions have to be held with the host enterprise so that it creates an appropriate environment by offering positive but challenging feedback to learners about their performance.

6.1.4. The implications of resituation

One of the most common assumptions within work experience literature has been that learning in school and learning at work are entirely different. It is hardly surprising, therefore, that little attention has been given to the relationship between theoretical and everyday knowledge and how to support the resituation of these forms of knowledge.

We have introduced the concept of resituation as a way of overcoming the separation of different forms of knowledge. The illustrations of Chapter 5 indicate that, although schools were unfamiliar with ideas like resituation, they were, in fact, trying to address these ideas in a practical sense, introducing new pedagogic practices to support learners to develop the capability to mediate between different forms of expertise and the demands of different contexts.

In the German illustration, educators attempted to support learners in horizontally resituating theoretical knowledge in the automobile factory by establishing a small number of service/production learning areas. In the first instance, this assisted apprentices to see how knowledge of the production process informed the organisation of work and work roles within the factory as well as enabling them to undertake specific tasks. In the second instance, the pressure of completing tasks to tight deadlines in the factory often revealed the inadequacy of the knowledge made available to them through the curriculum and led the apprentices to develop tacit knowledge in order to resolve the problems confronting them.

There are several interesting lessons arising from the experience of the Swedish school which highlight issues which have to be addressed if schools want to support learners to resituate knowledge horizontally and vertically. Learners developed a theoretical relationship with the world of work based on school instruction and then were able horizontally to resituate the different fields of knowledge they had acquired when they undertook their work experience. Learners were also encouraged to resituate their knowledge vertically by envisioning theoretically-constructed worlds, in other words, identifying the practical problems causing tensions in production, marketing or distribution and suggesting strategies to resolve those tensions. By varying the form of activity undertaken, learners were able to extend the process of resituation.

Working in accordance with a similar set of principles, the UK example illustrates the type of pedagogic practices educators can employ to support resituation. Educators organised seminars to help learners to resituate their theoretical knowledge and, with the practical experience of producing a newsletter, to support them to identify, on the basis of known tensions, future problems which the media industry might encounter. In both cases, the opportunity to engage with the tradition and possibility of practice supported learners in identifying a range of ways of reorganising work in the retail and media industries and in identifying how the curriculum in the school might have to change to support their further learning.

6.1.5. Ways forward in vocational and general education

One of the reasons for the dominance of the macrosystemic approach to innovation in education and training systems is that it offers policymakers a comforting thought, namely that the redesign of management arrangements for work experience will guarantee reform of learning. This approach ignores the question of how individuals actually learn through work experience. Another reason for the dominance of the approach is that pedagogic issues are difficult and elusive and much harder to change.

Taken in combination, these factors tend to mean that policymakers pay insufficient attention to learning. Yet, living and working in a knowledge society does not simply involve the application of existing forms of knowledge or skill or a swathe of existing rules. Rather, it suggests that people must respond reflexively to emerging economic, political and social issues in an innovative and creative fashion by establishing new rules to address the unexpected consequences of modernity. If policymakers want to prepare people for living and working in a knowledge society, they will have to incorporate into education and training policies a strategy for learning and pedagogy.

6.2. The implications of connectivity for pedagogic reform in work experience

The relationship between theoretical and practical experience and the development of polycontextual knowledge and skill lie at the heart of the knowledge economy debate. So that work experience can help to prepare people for the knowledge economy, we suggest that the concept of 'connectivity' can be used by researchers, policymakers and practitioners as criteria to review existing pedagogies.

First, the idea of 'kernel concepts' can be used to analyse the extent to which educators are beginning to overcome the dualism between theory and practice and to mediate their understanding of how to design new curriculum frameworks for learning and knowledge development. Second, the distinction between exploring the possibilities of practice and participation in existing social practices, the traditions of practice and unreflected practice can be used to assess how far work experience provides learners with an opportunity to address the contradictions which emerge in the processes of the workplace and which can stifle creativity and collaboration. We have suggested that this can be addressed by supporting learners to understand the limitations of practice, by offering them opportunities to recontextualise their theoretical and practical knowledge and skill in new contexts to create new knowledge and practices.

The idea of the 'practices of learning' can be used to identify the kind of support which learners need to develop the following capabilities: the intellectual basis for criticising existing work practices in school and at work; taking responsibility for working with others; conceiving alternatives; and contributing to the development of new knowledge, new social practices and new intellectual debates. It can also be used to identify the opportunities learners need to model and, wherever possible, implement solutions,

although this can only occur in a context where educational institutions and workplaces have developed a shared understanding about their respective roles in assisting learners to develop as boundary crossers.

One of the pressing questions raised for those involved in discussions on the creation of a knowledge economy is how to assist learners to resituate knowledge and skill in different contexts. This pedagogic approach will help to consolidate the practice of establishing a theoretical relationship with, and understanding of, the world of work. It will also provide learners with an opportunity to identify contradictions and to model solutions, even if they cannot actually implement them. Participating in this type of activity provides learners with an opportunity to develop their polycontextual skills. They have to work collaboratively and to mediate between different types and sources of knowledge in order to produce new knowledge. Another pressing question is how to assist learners to transform contexts, something which would involve all connective practices of learning outlined in Chapter 4.

Mediation can be used to indicate how far learners are developing capabilities which include the confidence to cross organisational boundaries or the boundaries between communities of practice and connect their knowledge to that of other specialists, whether in educational institutions, workplaces or the wider community. Equally, the practice of boundary crossing into any new context and its associated communities forces learners and educators to come to terms with the process of 'metamediation' (Hutchins, 1995). The concern with mediation alerts us to the fact that learning curricula or mediating artefacts do not simply stand between people and the context in which they are working – an assumption which prevails in much current literature about the role of knowledge in the economy – but they are among many elements that can be called upon in the performance of a task or to support understanding of a subject. Mediation is not a process that automatically occurs in a single direction, in other words, from a teacher to a student or from a computer to a student. The pedagogic challenge therefore, is to identify how certain mediating artefacts help to organise the use of other mediating artefacts and it is this process of metamediation which helps to create a powerful learning experience. The concept of metamediation is vital to understanding how to go beyond the idea that learners only need an experience of work and to realise that they need to develop an understanding of to how to participate effectively in workplace communities through using resources effectively.

One of the aims for work experience is to try to develop 'epistemic cultures' (Knorr Cetina, 1999) that is, cultures which facilitate knowledge creation through a commitment to the circulation of and access to

knowledge incorporated in personal and institutional life. We suggest that connectivity and the practices of learning through work experience provide a pedagogic strategy to help facilitate the development of such cultures.

6.3. Rethinking the question of quality

It is not surprising that technocratic approaches to work experience have frequently failed to support innovation (Fischer et al., 2000; Herlau et al., 2000) or to capture the learning which has occurred in and between activity systems and workplace communities of practice (Guile and Griffiths, 2001). We have demonstrated the limitations of current approaches to the question of quality audit and enhancement. If a new approach and reformulation are to take account of the issues raised in this book, that reformulation must relate to the practice of work experience, a term which we have used to highlight the culturally, socially and historically organised nature of work and learning. The theoretical considerations and illustrations which we have explored provide the basis for developing a new, analytical framework which explicitly provides an activity-based, situated and connective perspective on the relationship between work experience, innovation and quality.

Such a framework would need to acknowledge explicitly that the practice of work experience involves a form of mediation of theoretical and everyday knowledge, undertaking dialogic enquiry, boundary crossing, and resituation of knowledge and skill. In doing so, it would recognise the different cultural, social and political configurations of power and knowledge that students will encounter as they move between education and work. This quality framework would encompass insular reflexivity and connective reflexivity, reflecting the conceptual questions and issues involved in identifying more clearly what is being assessed by quality assurance strategies (see Figure 5).

Insular reflexivity refers to contextual analysis and learning or learning internal to those organisations (schools, enterprises) participating in programmes of work experience. Connective reflexivity refers to those organisations which review critically the assumptions they make about the purpose of the learning and development which work experience is supposed to support, the learning activities which are offered to students as part of their work experience and the nature of the relationship between education and business partners. The diagram relates the two forms of insular and connective reflexivity to the practice of work experience.

Figure 5. **A connective model for exploring quality in work experience**

A connective model for exploring quality in work experience				
FOCUS and CONTEXT				
Purpose and assumptions	**Learning processes/ activities**	**Practice of learning through work experience**	**Role of education and training provider**	**Outcome**
Review work experience in relation to agreed purposes.	Review how far learners have adapted to a work environment and demonstrated ability for self-management.	Review the tasks offered, learners' contributions and outcomes of action plans.	Review management guidelines.	Review how far preparation, debriefing and portfolio of achievements have supported learning
Reappraise purpose of work experience.	Review mediation of knowledge and experience.	Review participation in traditions of practice/ exploration of possibilities of practice.	Review obstacles and barriers to boundary crossing.	Review development of connective/ polycontextual skill.

Forms of Reflexivity — INSULAR — CONNECTIVE

This approach to quality in work experience represents a considerable step forward from the prevailing bureaucratic and mechanistic approaches described in Chapter 2. It provides a means of mapping an integrated approach to quality based on learning considerations, a process which is crucially neglected or is missing in other approaches. This framework requires explorations well beyond an exchange of information about the quality of learning: it opens ways of supporting and encouraging greater innovation in practice. Use of such a framework presupposes greater dialogue between learners, educationalists and workplaces about how to address such issues and challenges as boundary crossing, identifying pedagogic processes which support learners in resituating their learning and

creating environments for learning. It has the potential to transform quality assurance from a bureaucratically-laden procedure, which routinely fails to touch the deeper questions of learning, into a process which engages directly with their complexity.

6.4. Issues for policymakers

The development of a knowledge economy poses a number of challenges for European education and training (Nyhan, 2002). This book proposes a response to these challenges which goes beyond the established strategy of comparing national approaches to work experience and enquiring about the kinds of systemic and institutional preconditions that might enhance work-related learning.

We have presented two typologies to elucidate the relationship between skill development and work experience in the context of the knowledge economy. The first typology distinguishes between:

(a) those conceptions of generic skill which view it as the property of an individual and those which view it in terms of a relationship between individuals and the context in which they are working;

(b) the generic skills called for when undertaking work activities of a fairly routine kind compared with work activities that concern novel or unfamiliar issues.

The five models of work experience presented in this book reflect the impact of different economic, technological and social factors prevailing within European countries as well as different ideas about learning and development. We acknowledge that, although the models in this typology may be specific to different periods of economic and technological development and reflect changing educational ideas about the process of learning, they coexist in different countries. Taken in combination, the typologies provide a way of anticipating where the tension points or contradictions have either already arisen in specific conceptions of skill and models of work experience, resulting in the emergence of new conceptions and models, or where they may arise in future. In this sense, the typology provides both a conceptual and developmental framework for understanding the challenge of supporting learning through work experience.

One of the issues to which this alerts us is 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. This represents a

demand that involves learning how to contribute to the transformation of work contexts. This development suggests that there will be an even greater interest in, and demand for, an innovative, connective model of pedagogy and learning in work-based contexts, assisting learners in developing the capability for boundary crossing and knowledge development. On the one hand, this development presupposes that models of work experience will have to be based on ideas about learning and development. As we have indicated, this suggests that learners will need to be immersed in ideas as well as in the world of experience and it is the process of mediation which provides learners with a basis for connecting their context-specific learning with ideas or practices which may have originated outside those contexts. On the other hand, this development reinforces our earlier argument that, if work experience is to foster future-oriented capabilities, macrosystemic change in education and training should be informed by ideas about learning and pedagogy. Such ideas will influence the shape of the systemic and institutional conditions for enhancing different forms of work-related learning in initial and continuing general and vocational education.

One of the merits of the connective model of work experience is that it helps to address the complex relationship between policy, the learner, skills needed and pedagogy. Spelling out these relationships is important because, at policy level, there has been a failure to press for new theoretical and conceptual frameworks for relating learning in work-based contexts to formal education and training. It is clear from recent research that it is not possible to reform the launch or work process models of work experience by trying to reform the content of the formal VET component of learning alone.

The main reasons for the poor relationship between policy and practice include a lack of clarity about the aims and objectives of work experience, its delivery, the role of employers, the quality of relationships between employers and education, the nature of qualifications sought and the changes in the nature and modes of work. Those managing change need to be alert to the phenomenon of 'innovation without change', that is, the capacity of a system to accommodate the rhetoric of reform within the culture and practice of the status quo.

The policy analysis confirms the renewed public and sometimes rhetorical emphasis on learning in the workplace. Yet, work experience can no longer be viewed as developing a technical competence in something nor as providing an opportunity to use learning outcomes as though they capture in some way the authentic knowledge/skill developed by a young person in a specific situation. Increasingly, work experience will have to be viewed as a means of developing an involved sense of responsibility for learning how to

work and learn in routine as well as in novel situations and to connect the learning that occurs in education and the workplace.

The policies of governments, businesses and educational and vocational institutions towards work experience as an education and training strategy for the future would benefit from being informed by the practice of learning through work experience. Businesses and educational and vocational institutions could respond practically – as learning/knowledge creating organisations – to the challenge of the changing workplace and the likely demands of employment in the 21st century, by reviewing current work experience programmes using the methodological principle of contradiction to develop their interpretations of the connective model of learning through work experience. The concept and practice of mediation between formal and informal contexts of learning need to be extended and enhanced by further exploration of the concept of metamediation.

The new framework for considering quality allows for the identification, development and transfer of learning in a way which goes well beyond the checklist approach to quality issues. The framework is capable of being more extensively developed in the school/workplace context.

Throughout this book, we have tried to indicate that it is no longer viable to assume that innovations can be transferred from one European vocational or general education system to another. Increasingly, it is accepted that innovation has to be situated in its context. Moreover, resituation needs to be informed by the principle of mutual learning among researchers, policymakers and practitioners by means of collective self-engagement, self-organisation, and enculturation. This entails responding to new ideas as much as new practices. Taking up this challenge involves understanding the need to engage in boundary crossing in line with the principle underlying the connective model.

The implications of this for research, policy and practice at national, regional, business and educational institution level are significant. Policy making is constrained by political pressures, whereas applying research results tends to take time, to require patience, to take into account that real change occurs gradually over a long period. Even though policy makers may wish to take account of research, often the political consequences of doing so mean that they fail to do so. EU and national strategies should explore the weaknesses in the interface between policy and research with a view to making the relationship more effective and productive.

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This book identifies the achievements and limitations of successive European policy reforms and addresses future challenges in relation to work experience. It describes a new analytical tool – a typology for conceptualising different models of work experience in terms of learning, rather than the traditional approach of treating work experience as a social institution.

The book argues that, if work experience is to contribute to preparing individuals for the future, this can only happen if a shift takes place from viewing the primary purpose of work experience as a form of socialisation to that of connecting different modes of learning. It introduces and explains the meaning of the term 'connectivity', which lies at the heart of a new model of learning through work experience for the knowledge economy.

This focus on learning raises new issues for the research, policy and practitioner communities. It challenges them to address explicitly the ways in which work experience can assist individuals to connect theoretical and practical learning

Toni Griffithis, David Guile

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