From 'credentialism' to the 'practice of learning': reconceptualising learning in the knowledge economy.

Introduction

A variety of writers have argued from the 1970s onwards that a 'new age of capitalism' is sweeping the globe (Bell 1973; Castells 1995; Drucker 1993; Florida 1995; Reich 1991)[1].[1] This development, which is increasingly referred to as, the emergence of a 'knowledge economy' has usually been attributed to the complex inter-relationships and inter-dependencies that exist between the following four key factors.

- the quickening pace of global scientific and technological innovation which has resulted in knowledge becoming more important to global economic development than such traditional factors of production as land, capital and labour;

- the emergence of a new techno-economic paradigm - the 'informational mode of development' (Castells 1995; 2001) **new ref** - whose main features are: (i) the application of three new principles - *value-making*, *relation-making* and *decision-making* - to work organisation, work design and business-to-business interaction; and (ii) the deployment of information and communication technology to monitor and provide feedback on workflow, product and process performance and sales;

- the scale and impact of global multinational activity, which has resulted in the emergence of more customer-focused organisations, less hierarchical divisions of labour and new occupational profiles and new skill requirements;

- the global process of industrial convergence which is helping to blur the lines that separated traditional industries, for example, telecommunications, from newer ones, such as media and computing, and create new growth opportunities as technologies and markets converge.

Although it is widely accepted that knowledge and innovation are most important to economic development and wealth creation, there appear to be two slightly different, albeit complementary, views about which form of knowledge and innovation are most important (David and Foray 2002) **new ref**. Some writers view innovation in highly traditional terms as an exogenous process driven by the application of highly abstract and codified forms of scientific knowledge developed through formal research, that is, 'off-line', and sheltered from the regular production of goods and services in the workplace (Stehr 1994) **new ref**. Other writers view this as a gross simplification of the innovation process because firms are now under increased pressure to use their intangible assets (i.e. the knowledge and skills of their workforce) to innovate within the day-to-day context of the production of goods and services (Kim and Mauborgne 1999; Nonaka and Teece 2001) **new ref**. Thus, they argue that innovation must also be viewed as an endogenous process, that is, spurred through the exploitation of knowledge or information that is available inside firms and that enables them to offer superior value in their traditional businesses and markets.

Despite the existence of this difference of view about the type of knowledge that will be central to economic activity, a broad consensus exists that people, rather than such traditional factors of production as capital, will become the main source of value and

economic growth in this new type of capitalism, and that in future, more and more productive activities will make use of employees' intellect and creative capabilities (Florida 1995).[5]

One consequence of the trend towards knowledge-intensive economic development and the widespread acceptance that people now constitute the key factor of production, has been the emergence since the late 1980s of a global debate about the future relationship between national education systems and the economy. This debate has primarily been located in the business management (Drucker 1993; Reich 1991),[6] educational studies (Brown and Lauder 1991; Green *et al* 1997; Ransom 1998)[7] and educational policy (DfEE 1998; EC 1995)[8] literature. One of the main recurring themes has been a call to widen participation in, and to extend access to, education in order to prepare all members of society more effectively for working in the 'information' or 'knowledge-based' economies of the future (Green 1999) **new ref**.

From the mod-1990s onwards, publications from the European Commission (EC) (1995)[9] and UK (DfEE 1998)[10] have suggested that the shift in educational policy needed to achieve such objectives will involve more than just an expansion of education and training as it has been known. This shift will involve an extension of new learning relationships to all types of institutions and require a commitment from each individual to become lifelong learners throughout all stages of their lives (Young 1998).[11] The concept of the 'learning society', the 'learning organisation' and 'lifelong learning' have been regularly invoked to illustrate the centrality of 'learning' to the education-economy debate. In theory, this family of 'learning' concepts constitutes a visionary and challenging agenda. They affirm the value of placing learning, in all its forms and guises,

at the heart of economic development. They denote the need to create a different type of society, which has the capacity to renew the democratic process, combat social exclusion, avoid further degradation of the environment as well as develop economically.

This paper, however, argues that there is a paradox at the heart of the debate about the ways in which education should respond to the challenge of the knowledge economy. The debate appears at first sight to be both extremely visionary and democratic, since it has embraced the language of economic futurology as well as the zeal of progressive educationists and suggested that 'new learning relationships' need to be built between education and work. Yet, it is the contention of this paper that although the emergence of a knowledge economy raises new issues about the provision of learning, they are being addressed in terms of a very reductionist and one-sided interpretation of the concept of learning.

This paper argues that current EU and UK policies present learning solely as the acquisition of pre-existing knowledge and skill. As such, they appear to assume that the main issue is the 'constant updating of knowledge and skill', rather than addressing how to support people to develop the 'capacity to understand and anticipate change' (David and Foray 2002). To address how individuals learn to develop such capabilities, the paper draws upon recent debates in contemporary learning theory (Engestrom 1991; **new ref** Lave &Wenger 1991; Sfard 1998)[12]. It advocates a social practice conception of learning by arguing that learning is not merely a process of *acquisition* of knowledge and skill, it also involves having opportunities to *participate* in 'communities of practice' (i.e. education, work, community, on-line) and to learn how to *transform* such communities.

The paper concludes by arguing that the emergence of a knowledge economy is generating a number of problems that advanced industrial societies will have to confront. The first problem is to continually address both the intended and unintended consequence of economic and technological development (Beck, Giddens & Lash 1994).[13] The second problem is to prepare people to respond to an ever increasing range of dilemmas that cannot be solved by recourse to existing schema, routines and procedures. The paper argues that, in order to address these problems, it will be important for policymakers to develop a more 'reflexive' conception of learning. It identifies a number of tenets to illustrate the implications of reformulating public education policies to explicitly enable individuals to learn how to use ideas as well as practices that originate from one context to resolve the dilemmas experienced in another context.

The emergence of a new type of economy: a knowledge economy

It has been widely acknowledged throughout the social sciences that a process of structural transformation has been effecting advanced industrial societies for the last three decades. A number of social theories, such as Post Industrial Society (Bell 1973),[15] Informational Society (Castells 1995),[16] the Learning Society (Husen 1974),[17] Knowledge Society (Stehr 1994),[18] and Reflexive Modernisation (Beck, Giddens and Lash 1994),[19] have all tried to grasp the essence of the continuing and accelerating process of change within societies. Despite their different histories and theoretical concerns, it can be argued that one common theme runs through these theories (Kumar 1995).[20] They all accept that the process of *scientization* - the penetration of scientific knowledge into not only production but also most spheres of social and cultural life - has fundamentally transformed the productive basis of society, with the result that knowledge has superseded traditional factors of production, such as land, labour and capital, as the most

important determinant of performance in the global economy. Consequently, the different social theories tend to concur that knowledge economies and, by extension, knowledge societies are characterised by an ever growing expansion of human work beyond the sphere of direct, material production.

Throughout the 1980s and early 1990s, this process of scientization was perceived by social scientists to herald the end of an era of machine-led industrialisation, standardised methods of production and highly specialised divisions of labour (Piore & Sabel 1987).[21] It was argued that a progressive shift was occurring away from *Fordism*, the mass production of standardised goods, towards *Post-Fordism*, the production of more highly customised goods and services for 'niche' markets. Furthermore, it was asserted that the emerging methods of production presupposed a new division of labour - 'flexible specialisation (Piore & Sable 1987)[22] - that blurred the traditional distinctions between the conception and production of goods and services, involved the introduction of new occupational structures based upon more integrated forms of theoretical and practical knowledge and skill amongst all sections of the workforce and heralded the necessity for a less adversarial and more democratic approach to industrial relations on behalf of management and organised labour.

From the early 1990s, however, a rather different interpretation of the implications of the trajectory of economic and technological change started to surface in other branches of the social sciences, such as, business economics (Boisot 1998) **new ref**, economics of science and technology (David and Foray 2002; Lundvall and Foray 1996), and organisational behaviour (Nonaka and Takeuchi 1995). Rather than merely suggesting that one era of production was superceding another, writers such as David, Foray and

Lundvall elaborated a radically different argument. They claimed that knowledge, interpreted in its widest sense, now constituted the key factor that determined success in the global economy. These writers acknowledged the unevenness of the trajectory of change that had been occurring for some time across different industrial societies, industrial sectors and organisations, a development that led many writers to express skeptism about the claims made about the long-term implications of the new economy (Gordon 2000). **New ref** Nevertheless, they argued that this trajectory of change, based on a combination of endogenous and exogenous modes of innovation, was beginning to constitute a gradual acceleration of the transition to a knowledge-based economy (Lundvall and Foray 1996). The gathering momentum of this transition was partly attributed to the benefits of the fusion of computer technology and telecommunications, which had begun a decade or so earlier, and to the gradual maturation of the new digital information processes **(**David 2001).

One distinctive feature of the fusion of computing and telecommunications had been the creation an electronic infrastructure – the World Wide Web - that supported the global flow of communication. This development has been perceived to have a number of consequences. In the first place, it enabled the knowledge production system to become more widely distributed across a host of new sites and agencies and, thus, enhanced creative interaction among scholars and scientists and, equally, among networks of product designers, suppliers and end customers, with the result that new hybridities of cultural products, services and lifestyles were emerging across the world (Lash & Urry 1994).[34] In the second place, the new technologies had the potential to facilitate the exploration and analysis of the contents of gigantic databases to support research and development in universities, private research institutes as well as within enterprises, and

to create large-scale decentralised systems for sharing the fruits of exploration and analysis amongst networks and clusters of producers and users (David and Foray 2002).

In the enthusiasm to communicate a vision of the role of information and communication technology within the knowledge economy, overtones of technological determinism sometimes crept into the debate and, in the process, masked one extremely important issue about such technology (**new ref**). Information and communication technology is not a neutral technology. Depending upon the strategic choices made by an organisation, it could either be employed to *informate* or *automate* organisational practices (Zubboff 1988).[35] These different possibilities for the use of information and communication technology, in turn, presupposed fundamentally different demands for knowledge and skill. Pursuing the former approach tended to result in a demand for a new type of skill - 'intellective skill' – that is, the ability to work collaboratively with others to input, access, monitor and interpret symbolic data (Zubboff 1988).[37] A development that, in theory, required educational institutions to re-think the relationship between new curriculum, technology and pedagogy. In contrast, if the second option was pursued, it tended to result in information and communication technology being used to reinforce traditional fordist and taylorist work practices (Thompson & Warhurst 1999).[40] For example, automated data processing systems were designed to fit with extremely routine-based systems of vertically divided labour (Greenbaum 1999)[41] or to reinforce managerial regimes of control and supervision of work (Beirne *et al* 1999).[42] Developments that did not require additional levels of knowledge and skill let alone new forms of knowledge and skill.

Another feature of the increased role of knowledge within the economies of advanced industrial economies was the emergence of new modes of the production of, and sites for the production of, knowledge (Gibbons *et al* 1994).[43] Gibbons *et al* distinguish between two modes of the production of knowledge, which they refer to as Mode 1 (discipline-based) and Mode 2 (transdisciplinary). The former, which has traditionally been the dominant mode within higher education in advanced industrial societies, refers to the 'breaking up' of disciplines and the formation of new ones, has occurred in universities for some time, and implies no change in mode of knowledge production and no reduction in the autonomy of the universities. In contrast, Mode 2 knowledge production is usually characterised by the continuous interaction between theoretical ideas and practical contexts where new knowledge is produced and put to use (Young & Glanville 1999).[44] These interactions often involve a bringing together of university and business interests to collaborate on research projects that take place in diverse contexts, often temporary and constituted by people with expertise in a number of disciplines, and sometimes with expertise that it not based in disciplines, as traditionally conceived, at all (Tenkasi *et al* 1998).[45]

This trend towards the production of transdisciplinary knowledge is not automatically a characteristic of all organisations; it is mainly confined to either organisations or parts of organisations that are seeking to become 'knowledge-intensive' (Foray and Lundvall 1999) **new ref** and/or 'high performance' workplaces (OECD 1996).[46] Moreover, in order to secure competitive advantage from the innovations that flow from such business development strategies, organisations are striving to create ecosystems which support the flow of knowledge within organisational boundaries (Brown & Duguid 1998).[47] This involves them first, learning how to exploit both the existing pools of proprietary and

patented knowledge and the tacit skill and competence that is situated within organisational 'communities of practice' (Cappelli *et al* 1997).[48] In fact, similar trends are also manifesting themselves in regional development. Regions that aspire to become 'learning regions' (Florida 1995)[49] or 'high-tech' regions (Finegold 1999)[50] are also striving to create ecosystems that support the flow of knowledge within clusters of 'high-tec' firms in order to achieve sustainable economic advantage that will benefit the entire region. Second, encouraging workers to collaborate and share such knowledge in order to support innovation and wealth creation (Tenkasi *et al* 1998)[51] A parallel can be drawn with the experience of those organisations who chose to 'informate' work processes, knowledge creation and knowledge sharing also presupposes the development of new forms of expertise, often referred to as 'boundary crossing' skills (Engestrom *et al* 1995).[52] This term refers to the challenges faced by different expert communities as they encounter unfamiliar situations and try to work together to resolve common inter- or intra- organisational problems. The educational implications of the developments described in this section will be returned to at a later stage in the paper.

Linking education and the economy: a brief overview of the concerns of 1990s

Debates about the educational implications of economic and technological change have had a long history in advanced industrial societies (**new refs)**. During the late 1980s and early 1990s, the controversy over the changing nature of work became closely tied to the issue of educational planning and educational reform. National education and training systems increasingly came under pressure to respond to the challenges that global economic and technological change presented to occupational structures and occupational skill profiles (Brown & Lauder 1991).[53] Initially, one of the foremost concerns was that compulsory education was not adequately preparing 'non-college bound' students for the

transition into the emerging 'neo' and 'post-Fordist' labour markets characteristic of the time (Brown and Lauder 1991).[54] Subsequently, the focus of the concern shifted slightly as national governments became equally concerned about the transition of graduate students into the labour market, the continued training and development of the existing workforce, and the re-inclusion of disaffected communities within society (Green 1999).[55]

Throughout the early 1990s, one of the most influential contributions within the global 'education-economy' debate was Robert Reich's book 'The Work of Nations' (1991).[56] Reich's argument, as Young has observed (1998)[57], addressed both educational and economic issues. Reich argued that industrial societies were entering an era of education-led economic growth and that national education and training systems, rather than national economies would determine the fate of nations. From Reich's perspective, the process of globalisation, in other words the accelerated international flows of information, services, goods, and capital, was placing enormous pressures upon established industrial societies. Increasingly, the globalisation of production meant that newly industrialising societies were able to produce more cheaply the standardised goods and services that older economies had specialised in producing. Reich suggested, therefore, that established industrialised societies were confronted with an economic and educational challenge. Economic prosperity in the 21st century would involve continuous innovation and the production of specialised goods and services that other nations were not capable of producing. Moreover, he argued that if advanced industrial societies were to realise such economic ambitions, they would have to find ways of giving learning a priority in both the economy as well as in the education system.

In the case of education, he advocated a new set of principles for the 'curriculum of the future' – 'system thinking', 'risk taking' – in order to develop, what the referred to as, the 'symbolic analyst'. That is, the type of knowledge and skill required in innovative knowledge-based forms of production. These principles constituted a way of expressing the idea that the ability to apply knowledge was as important as knowledge itself, and that knowledge at the interface between subjects is sometimes as important as the subject knowledge itself (Young 1998). Despite his firm conviction that the goal of knowledge-based economic development was achievable providing educational institutions found ways to re-think their curricula in accordance with his priciples, Reich anticipated that only thirty percent of the 'jobs of the future' would require the skills of the 'symbolic analyst'. The vast majority of work, even in knowledge-based economies, would be in 'routine production' and in 'personal services'.

Reich's analysis of the relationship between the economy and education and prescription was, however, seized upon, albeit in different ways, by educational researchers and policymakers who were considering how to move beyond the traditional pattern and provision of education. The former (Brown, Lauder and Green 2001; Raffe ????: Young 1998) were inclined to view Reich's vision of education-led economic development in very positive terms, and to advocate the creation of a 'high skills' economy or the establishment of a 'unified curriculum' or 'curriculum of the future'. The common theme running through these three approaches was a concern to broaden the basis of the curriculum in 14-19 education throughout the UK to allow students greater flexibility of study within and between academic and vocational pathways.

In contrast, policymakers tended to accept Reich's affirmation of the importance of generic skill as some form of confirmation of their interest in extending 'key skills' into the 14-19 academic and vocational curriculum as well as the higher education curriculum (Guile 2002). The rationale for key skills, however, was based on a rather reductionist conception of the notion of learning. It stressed that because such skills could be defined, and assessed, separately from knowledge domains, they were important for future learning as much as mobility in the labour market (Payne 1999). **new**

During this period, the massive upsurge of interest in the 'educational' potential of information and communication technology also contributed to fuelling the vision of 'education-led' growth. As Owston has noted (1997: 27):[58] 'nothing has captured the imagination and interest of educators around the globe more than the World Wide Web'. The future of education and the economy was increasingly became perceived as being 'technologically-driven' (Tapscot 1995),[59] since it was claimed that 'information skills' would be critical to future economic success and educational success (Bates 1995).[60]

Attention focused in particular upon the educational value of connections to the World Wide Web. It was argued that these connections could be used in a number of ways to transform the provision of education to all sections of the population. Internet connections could be used to extend access to education more widely within society, especially amongst those groups who had traditionally not participated in formal education and training (Wasser Davidson 1997);[61] free teaching and learning, irrespective as to whether it was pre-school or post-graduate school, from the physical boundaries of classrooms and the time restraints of class schedules (Owston 1997);[62] and, to support the creation of new sites for learning within society, for example, local communities, user-groups, families

(Tapscot 1995),[63] and thus help to break down the barriers between those institutions (i.e. schools, colleges and universities) that had previously specialised in learning and those for whom learning had not been a priority (Young 1998).[64]

One consequence of the suggestion that future economic success will be 'education-led', and that education will become 'technologically-driven' and reliant upon some form of generic skill, has been that *learning* has become the leitmotif for social democratic governments around the world (Panitch 1995).[70] Governments have consistently employed the term to try and articulate the basis of a new relationship between education and the economy. The clearest expression of this emphasis for a new relationship between education and the economy can be located in the global debate about the idea of the 'Learning Society' and lifelong learning (Raggatt *et al* 1996).[71]

A new rationale for linking education and the economy: the idea of the learning society and lifelong learning

The origins of this debate about 'learning societies' lies in the work of Hutchins (1968), Husen (1974) and Schon (1971).[72] As Ranson has argued (1998)[73], although these writers concentrated upon different aspects of the idea of a 'learning society', they all embodied the liberal and progressive tradition of western thought and assumed that increased evidence of learning could be equated with the development of a more democratic society. Thus, they argued, albeit in different ways, for learning to be conceived of as a permanent process that occurred in multiple sites from the family, to the school, to the workplace and the community and throughout the life cycle.

The idea of the 'learning society' has resurfaced during the 1990s. One of its fundamental attractions is that its rather fuzzy utopian ideals can be converted into both an ideology

and a concept (Young 1998).[74] In the case of the former, the idea of a 'learning society' provides all stakeholders for example, individuals, communities, policy makers, with a vision of an idealistic and attainable utopia. Thus, as Ainley points out (1994),[75] by linking the idea of a 'learning society' to notions of skill ownership and investment in education and training, it is possible to present a view of society which reinforced the Reichian idea that the wealth of a society lay in the distribution of knowledge and skill rather than upon the division of wealth and power.

In the case of the latter, the 'learning society' has been used conceptually to provide a rationale for linking lifelong learning and the democratisation of education through the broadening access to learning opportunities, to the development of social capital and economic prosperity (Young 1998).[76] Thus, it helps to legitimate the value of increasing expenditure on education to boost national stocks of human capital. One of the clearest expressions of this concern for human capital development has been the global debate about 'learning organisations' (Livingstone 1997).[77] This debate is in part a response on behalf of policy makers to provide a concrete focus for promoting to the private and public sector the link between sustained economic success and investment in the training and development of the workforce (Livingstone 1997).[78]

There are, however, important sociological and educational reasons why the utopian visions of Schon, Husen and Hutchins have been appropriated by both progressive educationalists and policy makers nearly twenty years after they were first published as a strategy to try and democratise the relationship between education and the economy and as a rationale for lifelong learning (Young 1998).[79]

Sociologically, the idea of a 'learning society' denotes structural change and the need to renew social democratic ideals. On the one hand, it reflects the changes that have occurred in advanced industrial societies, for example, changes in the mode of production; the conditions for firms' profitability; the sites for learning and the production of knowledge; and the knowledge and skills individuals require to support their employability in the global economy. On the other hand, it reflects the interest expressed by 'Third Way' theoreticians and politicians to establish a more socially and educationally inclusive society by promoting a sense of 'social learning' (Coffield 1999).[80] In other words, to build trust and cooperation amongst economic and political institutions through linking investment in human capital results in broader and more equitable economic goals.

Educationally, the idea of a 'learning society' offers the comforting illusion to national governments that the solution to the complex problem of building new relationships between education and the economy can be accomplished through policies that place the responsibility for learning upon individuals (Coffield 1999).[81] As a result, EU and UK policy makers as well as some progressive educationalists have enthusiastically embraced a 'credentialist' agenda (Young, 1998).[82] From this perspective, the main challenge has been presented as supporting national prosperity by ensuring that the vast majority of the population achieve qualifications or certified skills and knowledge that relate to their future employment.

One of the outcomes of this creeping credentialism has been that, since the mid 1990s, EU and UK educational policies have rested upon three rather narrow assumptions about the process of learning and the conditions that support learning. Policies are inclined to

first, equate learning with the *acquisition* of either recognised qualifications or certified knowledge and skill (Green 1999);[83] second, imply that opportunities for learning can be achieved either through the adaption of the current educational institutional framework to increase individuals *access* to learning (Hayes et al 1995),[84] or through the deployment of information and communication to further transform *access* to different modes of learning (Guile 1998);[85] and third, accept unproblematically that the constant *accumulation* of qualifications in order to meet pre-set national targets for education and training constitutes sufficient evidence of the creation of 'learning society' (Coffield 1999).[86]

Taken in combination, these assumptions have resulted in the widespread acceptance of a number of issues about the relationship between learning and qualifications. On the one hand, the original Reichian idea that economic development should be education-led has been superceded by the notion of 'qualification-led' economic development. This is a much more impoverished notion since it implies that people are 'empty vessels' who, once they have been 'filled-up' with the appropriate knowledge, skills and attitudes, will be able to master the new demands that are placed upon them (Griffiths & Guile 1999).[87] On the one hand, they imply that learning is associated with the development of cognitive structures inside the head that can be skillfully applied in a variety of contexts to resolve domain-specific or domain-free problems. In this view knowledge and skill are seen to be analogous to tools that can be applied to particular situations (Billett 2001). **New ref**

A commitment to increase access to education and training, encourage people to acquire qualifications and set targets for the accumulation of qualifications within society is an inescapable element of any policy for public education. It reflects the long-standing concern that policy makers have had about the relationship between qualifications,

employment and economic success (Dore 1976).[88] However, the emergence of a knowledge economy has generated new types of social and political problems that cannot merely be resolved either through improving access to, or by varying the delivery of, the same type of education and training.

The first problem has been identified by Beck, Giddens and Lash (1994).[89] These writers argue that the globalising tendencies of economic and technological change and development continue to transform both the structural basis of society and the type of knowledge and skill required for work and participation in civil society. They contrast the 'high modernity' of the post-Second World War phase of industrialisation with what they refer to as *reflexive modernity*. The former, they suggest, was characterised by a swathe of pre-given rules in the form of the norms of modern institutions and organisations such as mass trade unions, political parties or large hierarchical forms. In contradistinction, they suggest that *reflexive modernisation* is characterised by quite different conditions and features.

Beck, Giddens and Lash argue that modern societies produce 'risks' and that unlike the era of classic industrialisation, these risks are of their own making, and are the direct, albeit unintended consequences of applying scientific ideas to social problems. Lash provides a very clear and illuminating example of the contradictory nature of the trajectory of scientific and technological development. He argues that information and communication technology has simultaneously been responsible for the destruction of many traditional practices in economic, social and cultural spheres as well as opening up spaces for aesthetic, cultural and economic innovation (Lash 1999).[90] The constant generation of 'risks' leads Lash to conclude that a new challenge faces individuals and

communities. The challenge is to be able to continually create new 'rules' that assist them in analysing and responding to cultural, economic and social problems and dilemmas. This implies that people can respond 'reflexively' (Guile 2001) to emerging economic, political and social issues in an innovative and creative fashion.

This emphasis on reflexivity introduces an extra dynamic into the debate about lifelong learning. It suggests that, if policymakers want education to lay the foundations for 'employability', they will have to avoid conceiving knowledge and skill cannot as commodities to be acquired, converted into people's private property and used mechanistically to inform conduct (Sfard 1998). It is important to recognise that knowledge and skill are related to, and 'situated' in, different from of social practice (Lave and Wenger 1991) and, moreover, that they are both learnt and developed through participation in the social practices associated with those communities.

The second problem has been identified by Young (1998).[91] He argues that the shift towards a knowledge economy has problematicised the traditional link between qualifications and employment. Unlike the past, employers are no longer using qualifications to select individuals for fixed and routinised roles, nor for stable employment. Increasingly, qualifications serve as a proxy measure for an ability to achieve in the future, although in very different ways from those associated with traditional qualifications (Guile 2002). **New ref** In addition, given that knowledge economies are characterised by increasingly fluid occupational structures, work roles and conceptions of what knowledge and how it should be used to foster innovation, they are generating the need for new types and combinations of knowledge and skill. As a result,

the acquisition of qualifications does not necessarily provide any guarantee that people have yet developed, or will develop, the type of capabilities which will be required in the future (Young 1998).[92] Increasingly, the key issue is the extent to which people are prepared either to innovate and contribute to changing work processes, or to take responsibility for working with others to develop the capability to do so (Guile & Fonda 1999).[93]

The tenacity of the credentialist assumptions within much of the research and policy literature has obscured several considerations about the purpose and process of learning. One such consideration is that the process of 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 also introduces an extra dynamic into the debate about lifelong learning. Learning involves the construction of new knowledge, identities and skills or the transformation (rather than the application or use) of something that has been acquired elsewhere. This brings attention to the fact that learning is a developmental process in which individuals mediate the relationship between the different types of knowledge and experience which they encounter in educational institutions, work and the community (Guile and Griffiths 2001). It also involves changes in their identity, a process of development which, arguably, has to occur if their future actions are to be informed by new understandings and insights which learners have developed.

Thus, it follows that, once living in a knowledge society/economy has been conceptualised as a reflexive process, and learning is viewed as a social process, there

appears to be a paradox at the heart of the current global debate about the centrality of learning to economic development. A sole reliance on credentialist assumptions constitutes a rather one-sided and impoverished conception of learning. UK and EU policy makers are addressing the challenge of the knowledge era in terms of a very traditional educational interpretation of what learning means, and promoting rather narrow conception of the 'skills' (i.e. 'key skills'/'key qualifications') as the essential foundation for functioning effectively in this new context.

In contrast, the challenge for education appears to be to develop a more future-orientated perspective about the relationship between education and the economy that does not simply equate credentials as evidence of employability, nor credentialist policies with the creation of a 'learning society'. Achieving this future-orientated perspective, requires educational policies being reformulated to assist learners to develop a *transformative* rather than an *informative* relationship with the world (Guile and Young 1999). This implies having opportunities to participate in, and the opportunity to work with others to transform, social practices in order to develop the knowledge and skill they will require for working and living in knowledge economies or societies. To explore what this might mean in pedagogically, it will be essential to re-think what is meant by learning.

Overcoming credentialist assumptions about learning: re-thinking pedagogy

As the last section argued, educational policy has been based on a number of assumptions about learning: for example, an explicit acceptance that learning is chiefly concerned with acquiring the form of knowledge or skill warranted by qualifications, and an implicit acceptance of certain ideas about the process of learning, which have their origins in

cognitive psychology. Thus, policymakers tend to perpetuate the notion that learning consists only of assimilating or processing representations of the world, such as textual, statistical or pictorial data, mentally storing this 'data' and subsequently retrieving it at a later time.

There has, however, been mounting resistance for some time to the assumptions of cognitive psychology that have been accepted as unproblematic by policymakers, and which have underpinned and informed the introduction of, and assessment of, generic skills in national qualifications (Billet forthcoming). This resistance is connected to a debate, which is in its own terms, principally an argument about the values of the competing 'cognitive' and 'situated' or 'socio-cultural' (Sfard 1998)[95] paradigms of learning. One result of this debate has been considerable discussion about the limitations of the notion of 'information processing' and 'transfer' as explanations of how the mind operates and how humans learn to operate effectively in different contexts (Beach 1999; Greeno 1997; Lave 1987). However, the debate raises fundamental questions about learning that are particularly relevant to any reconsideration of the relationship between education and the economy.

Sfard (1998) [96] summarises the complexities of the debate by distinguishing between the concept of learning as a process of the *acquisition* of pre-existing knowledge and skill and the subsequent *processing* of that knowledge and skill, in contrast to the idea of learning as a process of *participation* in 'communities of practice' (Lave & Wenger 1991).[97] Building upon the contributions provided by the 'situated' theories of learning (Lave & Wenger 1991; Greeno 1997) [98], Sfard points out that writers in this field maintain that the organisation and construction of knowledge and learning are socially and culturally constituted. Yet, as Billet (2001) identifies, from a socio-cultural

perspective, there are four ways in which the constitution of knowledge and learning occur and come to be situated. These are: the *phylogenetic* – the contribution of knowledge arising from the evolving history of the human species; the *sociocultural* – the particular requirements of evolving social practice; the *ontogenetic* – the ongoing products of individual learning throughout their lives through interaction with the social world; and the *microgenetic* – the moment-by-moment learning of individuals.

These distinctions highlight that all forms of knowledge and learning are actually embedded or situated in different types of 'communities of practice' (for example, scientific communities, educational communities, local communities, on-line communities). The notion that learning is situated suggests therefore that it is a dynamic social process involving individuals having opportunities to participate in the social and cultural practices associated with different communities of practice. The idea of learning through participation does not negate that humans can become knowledgeable through acquiring knowledge, rather it alerts us to the extent to which this happens as humans learn how to use the 'affordance' provided within specific communities to apply their knowledge and skill within different forms of social practice (Billet forthcoming).

Lave and Wenger's notion of situated participation provides a much broader conceptual framework for curriculum design and pedagogy compared to the technical-rational perspective that has been dominate within the education systems of advanced industrial societies (Griffiths & Guile 1999).[99] From the perspective of the latter, knowledge, skill and attitudes can be taught separately from their actual context of origin or context of use. Thus, individuals are assumed to unconsciously assimilate relevant academic or workplace knowledge and skill. In contrast, the notion of situated participation highlights

the advantages of having a conceptual framework that enables people to understand the relationship that exists between the learning that occurs within a specific context, and the learning that occurs between contexts. Not least because it is impossible to 'deny that something does keep repeating itself as we move from situation to situation and from context to context' (Sfard 1998).

It is neither a coincidence nor serendipitous that people and communities build and use concepts that are congruent with those of others, nor that they contest many concepts that are shared within different communities. The existence of this congruence within the learning process highlights the complex relationship that exists between *phylogenetic* development and *sociocultural* development. The former has resulted in the codification of knowledge through the use of 'shared procedures' that have been spatially, temporally and hence historically a feature of cultural development in societies (Toulmin 1999). **new ref** Thus, phylogenetic development has provided the conceptual foundation supporting the development of both disciplinary and transdisciplinary knowledge. In this sense, disciplinary (e.g. scientific or social scientific) or transdisciplinary knowledge are never totally 'situated'. They provide resources, for example, concepts and methodological techniques, that individuals and communities can use to mediate their understanding of situations and thereby work together to resolve common problems: as Prawat (1993) [101] eloquently states, 'ideas educate attention'. The idea of sociocultural development presupposes that codified knowledge can be resituated in forms of social practice associated with specific 'communities of practice' as well as the development of 'local' knowledge in those communities (Geertz), **new ref** to facilitate the effective enactment of particular forms of social practice. The complex relationship between phylogenetic and sociocultural development suggests, therefore, that educational policies may have to

consider how to incorporate a strategy for viewing learning as a process of 'acquisition' and 'participation'.

Towards a social practice conception of learning: the idea of reflexive learning

A number of writers have recently attempted to identify the implications of a number of ideas that arise from 'socio-cultural' or 'situated' theory for learning in formal education (Billet forthcoming; Guile and Griffiths forthcoming; Guile and Young forthcoming; Wells 1999; Young and Glanfield 1999). One of the striking features of this work is that it presupposes, albeit in different ways, that learning is a sociological and an educational process. Sociological, in the sense that these writers acknowledges that learning always takes place in specific contexts, but that these contexts themselves are a product both of people's activities and of different historical circumstances, and the process of learning involves the transformation of contexts. Educational in the sense that it reflects the tension between the trans-contextual and context-specific nature of knowledge and skill. It is possible to summarise their ideas in terms of the following five tenets.

Learning is situated

Learning is always contextualised. It occurs within socio-cultural contexts and involves participation in communities of practice.

Knowledge and skill are situated

Both are located and embedded in communities of practice. It follows that if learners are to acquire knowledge or skills, they have to gain access to the 'communities of practice'

within which specific bodies of knowledge and skill are embedded; and to use the affordances access provides to participate in social practice.

Ideas that originate beyond the context in which learning takes place are crucial to learning

Ideas provide the frameworks for people and organisations to open up new and different aspects of the immediate contexts of learning.

Cultural tools, such as books, computers, discourses and schema have a crucial pedagogic role in modern organisations

Cultural tools do not 'stand between' people and the world (Cole 1998), rather they help people to mediate their relationship with, participation in, and transformation of, the world.

Evolving and transforming social practice involves people acquiring new forms of 'knowledgeability'

This 'knowledgeability' can only be developed if members of communities of practice are immersed in ideas as well as in the world of experience. This involves them developing the capability to cross boundaries between different communities of practice.

The next part of the paper uses these five tenets to highlight how educational policies will have to be reformulated to assist learners to develop a more reflexive and hence transformative relationship with the world.

First, to shift the focus from the acquisition of the canonical knowledge enshrined in curriculum, irrespective as to whether it is delivered through traditional transmission

methods or made available on-line, to a social practice conception of learning involves a number of steps. To begin with, teachers have to acknowledge that subject knowledge has been 'de-situated' from the fields where it originally arose and the practices with which it was originally associated, and is presented to students through curricula structures. In addition, teachers have to accept that such knowledge is only acquired in so far as students are presented with opportunities to situate it. The act of situation anticipates the next step in the movement towards a social practice conception of learning; namely, acknowledging the 'dialogic' basis of learning (Wells 1999). In other words, appreciating that 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 very far from being one of simple transmission and repetition.

This implies, as Cobb & Bowers (1999) [103] argue about teaching students to acquire and manipulate mathematical concept, developing mathematical reasoning is not a purely mental phenomenon, it also involves providing students with opportunities to participate in communal or mathematical practices so they can mediate between concepts and practice. They further argue that this can only occur if instructional designs are re-thought to take greater account of the relationship between the subject curriculum and the 'situated' curriculum on which it depends. Cobb and Bowers research, therefore, suggests that securing any significant improvement in the quality of teaching and learning involves a much more radical pedagogic agenda than most of the policy measures currently favoured either in the UK or within many countries in the EU. Furthermore, it can also be argued that such pedagogic developments are more likely to contribute to the production of transdisciplinary knowledge than current curricula practices (Young & Glanville

1999), [104] since they encourage a continuous interaction between theoretical ideas (i.e. de-situated knowledge) and practical contexts (situated knowledge).

Second, if the intention is to promote learning throughout people's lives in order that they are able to address continually changing circumstances, it is clear that educational institutions will have to accord different priority to the relationships they develop with networks and communities of practice than is their current practice. They will also have to support students to use concepts that emerge from different subjects or disciplines as cultural tools either to interrogate real world problems or to facilitate their participation in the different social practices associated with communities of practice. The provision of such arrangements will provide students with access to broader cultural systems where they can learn to participate in more diverse social practices, and develop their capability to relate social practices to formal education and *vice versa*.

A natural starting point for educational institutions might be to re-think the existing links they have through programmes such as, work experience, which are well established features of the UK and EU educational systems. Yet, as Griffiths and Guile observe (forthcoming) [105], maximising the value of work experience as a strategy to prepare people for the 'knowledge era' does not simply mean providing more students with access to work/community experience and establishing procedures to accredit work-based experiences. Assisting students to learn through work experience involves educational institutions re-thinking how to provide opportunities for students to apply the concepts that they have acquired in formal education to interpret the reality of workplace cultures and practices, and *vice versa* relating everyday experiences to more formal bodies of knowledge. Equally, it involves workplaces enabling students to participate in

communities of practice and supporting them to negotiate their own learning in those 'communities'. Thus, in both cases, it involves educational institutions and workplaces considering how to assist students to become 'boundary crossers' and to develop *polycontextual* skills, the ability to participate in and evolve social practice by relating the interests and needs of one community to another. A capability that is increasingly as essential feature of working effectively within advanced industrial societies (Griffiths and Guile forthcoming). [106]

Third, although the idea of participating in communities of practice' offers some promising clues as to how to extend the notion of acquisition and to link the notion of learning between school and work, it is important to avoid idealising the notion of participation. As Lemke (1997)[107], has presciently observed, it is not always possible to acquire mastery of specific cultural practices through participation in certain communities of practice. Lemke argues that people not only learn from participating in specific communities, but they also learn across activities and communities and, moreover, that it is the combination of both processes that allows them to form new identities as well as acquire new forms of knowledge and skill. Therefore, in addition to work experience, educational institutions can use information and communication technology as a cultural tool to assist students to mediate their relationship with the world. According to Lemke, the ability to connect networks that have not been previously connected in order to extend individual and communal socio-cultural resources will be a prerequisite for effective communication (Lemke 1997). [69] By using the communicative potential of information and communication technology, students can be supported to participate in 'distributed' communities of practice. In this way, they are not necessarily restricted by the ideological influences of those communities to which they either are members or are denied

membership. This is only possible, however, if educational institutions utilise the informating rather than the automating potential of information and communication technology. The former allows students to extend the sources of information to which members of communities of practice have access, expand their socio-cultural basis and assist them to develop new forms of 'knowlegeability'. The latter restricts them to information retrieval and data processing.

Fourth, given the explosion of knowledge-based economic and technological activity, advanced industrial societies are constantly generating new 'risks' which are the inescapable outcome of applying scientific knowledge to social problems (Beck 1987). **New ref** Traditionally, science education in schools, colleges and universities has promoted the idea that ordinary people have to rely upon the advice of experts, since it has been assumed that science is value free and that lay people are ignorant of the complexities of science. This form of one-way dependency on the exert advice of others is increasingly out-dated in the 'knowledge era', since multiple sources of scientific information are readily available to the entire population of a country. Furthermore, as Irwin and Wynne (1997)[108] have pointed out, science is not value free, it is a social and cultural phenomenon and scientific knowledge always incorporates its social and cultural roots into its own assumptions about future trajectories of scientific development. Thus, educational institutions face another new and pressing challenge as they enter the increasingly risky territory of the 'knowledge era'. They will have to re-think how to support all members of society to develop those forms of 'knowledgeabilty' that enable ordinary people and the scientific community to enter into dialogue about common concerns (Young and Glanville 1999)[109]. This process has to be based on a form of 'mutual trust' through which each respects what the other has to offer and what they share

in common. Resolving this dilemma involves immersing students in ever wider networks and communities of practice to enable them to develop the capability to mediate between competing knowledge claims. This implies that educational institutions will have to support new pedagogic interventions that counterbalance traditional strengths as indicated by examinations with the development of broader-based and more future-orientated forms of social and cultural capability.

Finally, one of the implications of the shift away from an acquisition conception of learning is that a greater focus should be given in educational policy to supporting students to develop new knowledge and new social practices. For this to happen, as Griffiths and Guile have argued, educational policies have to support students to come to terms with the 'traditions' of practice as well as the 'possibilities' of practice. In other words, if the primary purpose of an educational policy based on the notion of participation is only to immerse students in existing social practices, it may result in them simply developing an attachment to a set of un-reflected social practices. This can mean students are unlikely to identify any qualitative differences between the knowledge and practices associated with different activities undertaken within specific communities of practice. In contrast, if educational policy is to use the idea of participation to prepare students for working and living in a knowledge economy/society, then educators have to find ways to present students with opportunities to engage with the 'possibilities' of social practice.

In an attempt to elucidate the pedagogic implications of such a social practice conception of learning, Griffiths and Guile (forthcoming) suggest it will involve finding ways to support students to:

- understand and use the potential of subjects as conceptual tools for seeing the relationship between their workplace experience and their programmes of study as part of a whole?

- develop an intellectual basis for criticising existing social practices and taking responsibility for working with others to conceive, and implement where possible, alternatives?

- 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?

- become confident about crossing organisational boundaries or the boundaries between different, and often distributed, 'communities of practice'?

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

Conclusion

This paper has argued that the current educational response to the challenge of the knowledge economy is fundamentally flawed. Initially, it has drawn attention to the limitations of the notion of the 'learning society' and the emphasis on the accumulation of credentials as a strategy to respond to global economic and technological development. It

then moved on to argue that the knowledge economy is generating new issues about the provision of learning, however, these issues are being addressed in terms of a very traditional interpretation of the concept of learning. It further argued that current EU and UK policies are based upon an impoverished concept of learning that only understands learning as the acquisition of pre-existing knowledge and skill. This paper put forward an argument for a social practice conception of learning, based on participation in communities of practice. It concluded by identifying a number of elements of such a theory of learning and explored some of their pedagogic implications. In doing so, the paper has raised a number of issues relevant to the wider debate about the contribution that education could make to the further development of a European knowledge economy.

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