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A CURRICULUM FOR THE 21ST CENTURY? TOWARDS A NEW BASIS FOR OVERCOMING ACADEMIC/VOCATIONAL DIVISIONS[1]

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> In the 21st century, education will be the foundation of material as well as intellectual progress. The challenge is to develop an education system adequate to the economic and social demands of the next century . . . (and) that innovative capabilities be spread throughout the whole population. (Finegold *et al.*, 1990)

1. Introduction

The quotation above from the beginning of the Institute for Public Policy Research (IPPR) report, *A British Baccalauréat*, captures well the aim of this paper, which is to contribute to the development of a post compulsory curriculum 'adequate to the demands of the next century'. There are two issues here – one quantitative and concerned with levels of participation in post compulsory education; the other, qualitative, concerned with the content and quality of learning. The quantitative issue is whether a curriculum, which was established when at most 20 per cent continued in education after 15, is appropriate when at least 80 per cent are expected to continue until 18 and reach the levels of achievement that are currently reached by only 20 per cent. The qualitiative issue is whether expanding participation on the basis of existing curricula, even were it to prove possible, would provide young people with the kind of skills and knowledge that are necessary in the likely circumstances of the 21st century. The aim of this paper is to explore those circumstances and their curriculum implications.

Taking the English and Welsh system of post compulsory education and training has an advantage from the point of view of this analysis as it can be seen as an example of a 'worst case'. It is an extreme example of a highly industrialised country which combines low participation, deep social class divisions and a curriculum which,

structurally, has changed little in half a century or more. Paradoxically, it is the backwardness of the system in England and Wales that may provide us with insights that do not arise so directly from the more developed systems on the European continent.

Let us consider, for the purposes of comparison, two cases of countries in which social class divisions are significantly less than in England and Wales. One is of a country (and I suggest that the Netherlands is a good example) which has a divided educational system, but one that is not embedded in a deeply divided social class structure. In such a situation, it is unlikely that the educational divisions will have the social consequences on levels of participation that they do in England and Wales. In other words, considerable expansion of levels of participation and achievement will be possible, even through a divided educational system.

The other case is of a country (and here I suggest Japan as an example) in which, though the academic curriculum is no less dominant than in England and Wales, social selection is deferred until the end of secondary schooling. In Japan secondary education has expanded so that now virtually all students continue until 18 or 19, despite the absence of any substantial changes in the curriculum.

Neither such possibility is open in the English and Welsh case which is characterised by a continuing cleavage between social classes, a deeply divided system of qualifications, and a narrow and elitist academic curriculum. It may be that it is the very impossibility of reforming the existing system in the UK that has led to a more radical analysis emerging and finding support (Finegold, *et al.*, 1990; Young and Watson, 1992). Furthermore, in taking academic/vocational divisions as its focus, it may be that such an analysis will give us some insights into the curriculum that will be necessary for the 21st century. It is to this analysis that we now turn.

2. Divided Qualifications, Divided Curriculum

The IPPR report, *A British Baccalauréat*, is probably the most comprehensive critique of the UK system (here, as in the report, UK will refer to England and Wales only) of post compulsory education that has yet appeared. Its analysis is distinguished in two ways from the plethora of other reports on post compulsory education that have appeared in recent years. The report begins by restating the widely agreed criticisms of the narrowness and exclusiveness of the English academic route (only 30% of the cohort take it, and the vast majority take only two or three subjects), and of the poor quality and lack of availability of 'vocational' alternatives (four times as many places are

available for 2 year academic courses as for full time vocational alternatives). However, it goes on to argue that the cause of these weaknesses cannot be found in the inadequacies of the separate routes, but in *the divided system itself.* In other words, they are the direct outcome of having *separate* academic and vocational *tracks* leading to separate *qualifications.* The report's prescriptions for a *unified system of qualifications* that 'will end the division between education and training' follow from this argument. Secondly, the report does not just focus on the structural issue by drawing a distinction between a divided and a unified qualifications system. It also considers the implications of a unified system of qualifications at the level of curriculum practice.

The report begins by reviewing the failure of a variety of attempts in recent years to reform the two (academic and vocational) tracks. Two such reform strategies are worth referring to as they reflect examples of 'borrowing' from other countries. Firstly, there are the attempts to diversify the academic track to give it a broader appeal and make it less exclusive – what might be called *the French solution.* Secondly, there are the efforts to enhance the status and content of vocational programmes along the lines of the German 'dual system'. The report concludes that, in the UK, these reforms have inevitably come up against the barriers of a divided system and in particular its assumption that sometime between the ages of 14 and 16 young people can be divided into two groups – the academically gifted (at least relatively), and the rest.

Attempts to diversify advanced levels are restricted by two of the most basic features English academic track. Firstly, it is explicitly designed for selecting the 'top 20 per cent' and its normative referenced model of assessment is geared to this. A recent indication of this is given by some public reactions to last year's Advanced level results. The modest increase in higher pass grades was used by some not as evidence of the improved level of performance of the system but of falling standards of marking. The second feature of Advanced levels is that they are not a *curriculum framework* capable of reform and modification like the French Baccalauréat. They consist of individual subjects clearly separated from each other with their own rules and traditions.

The barriers confronting attempts to enhance the status and content of vocational alternatives are different but no less severe. Quite apart from the proliferation of Examining Boards and the lack of clarity of progression routes to higher levels, they face the fact, regardless of their content, that vocational qualifications are judged by employers and university admission tutors as inferior.

The IPPR Report goes on to identify *six* main weaknesses of the divided system in England and Wales.

- it is based on 19th century assumptions (now being increasingly challenged) that industrial economies require the separation of mental and manual labour and which provides the justification for academic/vocational divisions;
- it is a system dominated by selection when the problem now and in the future is to increase both the quantity and quality of participation post 16;
- it is inflexible in that it separates students into different academic and vocational tracks and inhibits movement and transfer between them;
- it inhibits innovative combinations that can link theoretical and applied studies;
- it exaggerates differences between high and low prestige institutions and programmes, reinforces the process of educational stratification, and leads to the particular devaluation of vocational education and training that characterises the system in England and Wales;
- in combination with the unique structure of the labour market which provides incentives for early school leaving, it locks the country into a 'low skill equilibrium' (Finegold and Soskice, 1988).

Finally, the main focus of the report's analysis is on the strategic role of qualifications and how a divided system of qualifications is inevitably dominated by its function of *selecting* young people for higher education or employment. A qualification system that is dominated by selection limits both levels of participation and achievement and the potential of innovative curriculum reforms. Meanwhile, the government, in its proposals for what it refers to as a *modern* system of qualifications in the 1991 White Paper, *Education and Training for the 21st Century*, has decided to stick firmly to a divided system, albeit in a reorganised and rationalised form. It is therefore not surprising that it has been the IPPR report's proposal for a *unified qualification system* that has stimulated most interest. The specific recommendations are for:

- a single national Qualifications Authority to replace the separate regulating bodies (the Schools Examinations and Assessment Council and the National Council for Vocational Qualifications) and the separate Examination Boards that currently award academic and vocational qualifications; and
- a single integrated diploma, normally to be achieved at 18, to

replace the current alternatives of either a cluster of A level subjects (and in some cases AS (half A) levels) or one of the variety of vocational qualifications that are (at least in theory) available for students at 16.

This focus on the interdependence of the qualifications system and the curriculum is partly a recognition of the neglect of previous analyses of the curriculum. Qualification systems, it argues, are key factors that distinguish between systems of post compulsory education with high and low levels of participation (Finegold *et al.*, 1990, p. 14), and they differ according to the priority they give to *selection*, the *setting* of standards and the *empowerment* of students.

This analysis, in showing how the English qualification system is characterised by the dominance of its selective function, and its use of exclusion as the main means of maintaining standards, goes a long way to explain the persistence of low participation and achievement. The importance given to qualifications in the report also reflects the dominating role that assessment and in particular terminal examinations have had on post compulsory education in England and Wales (Wolf, 1992). In the absence of any direct role for the state, Examining Boards, which are mostly either private charities or owned by the Universities, exert considerable power. They are, in effect, the lynchpin of the qualification system and have a stranglehold over the curriculum. The *British Baccalauréat* proposals for a unifed system of qualifications and a single diploma are not, therefore, only about reforming the curriculum. They involve major institutional changes and pose a threat to major vested interests – not only the Examining Boards, but the private secondary schools, one of whose main attractions to parents as an alternative to state schools is their examination successes. In countries where the state has a more direct role in the curriculum, the *separate* significance of qualifications is likely to be much less. There are already indications of this in England and Wales in the compulsory phase of education (5–16) which is now governed by the National Curriculum as well as by the Examination Boards.

As stated at the beginning of the paper, the curriculum issue identified in the IPPR report is not only concerned with how to raise the levels of participation in post compulsory education. It is also about the content and quality of learning. The report makes clear the inappropriateness of both the traditional academic curriculum of Advanced levels as well as one based on occupationally specific skills for the learning needs of young people who will be adult citizens seeking employment in the 21st century. It is therefore the social and

economic basis of a new *curriculum* that is the main focus of this paper and to which I now turn.

The *British Baccalauréat* proposals for the curriculum follow from the argument for a unified qualifications system. Instead of having separate academic and vocational courses, the curriculum would consist of a range of theoretical and applied modules within a *single unified* system. Students then would choose from within a number of routes or pathways according to their interests and aspirations and taking account of their previous achievements. However, replacing a curriculum based on separate academic and vocational tracks by one consisting of a unified system of modules is not just a new way of organising the curriculum, like replacing school subjects with interdisciplinary themes. Academic/vocational divisions have their origins both in a culture which associates manual work as of low status and in an economy which was based on the separation of mental and manual labour. A unified curriculum, on the other hand, does not separate the preparation of young people for employment from the wider role of preparing them to become citizens in a democratic society. It follows that such a curriculum implies a very different form of economy to that which has been dominant in industrialised societies since the last century.

In considering the grounds for such a curriculum, and in beginning to specify the form that it might take, it is necessary to examine the economic basis of the separation of academic and vocational education and what indications there are that it may be changing. I am referring to the growing body of research in a number of countries that suggests we are at the end of an industrial era dominated by mass production of goods and services, and that there are signs of a new mode or production emerging, variously characterised as *post Fordism* and *flexible specialisation* (Piore and Sabel, 1984; Kern and Schuman, 1985: Mathews, 1989; Murray, 1989). All these writers recognise that the changes they describe are not inevitable and that they are political as much as economic. However, what is important from the point of view of this paper is that they all recognise the emergence of new relations between education and the economy. Whereas under mass production, the economy set severe limits on the development of the education system, flexible specialisation itself depends on prior education and political changes. We are it is argued entering an era of education (or more broadly human resource-led) economic growth, when, as Reich (1991) and others argue, it is *national systems of education and training* rather than *national economies* that will determine the fate of nations.

3. Specialisation in the Curriculum: Beyond the Specialist/Generalist Distinction

Early and narrow specialisation has for long been regarded as a distinctive feature of English post compulsory education, and is increasingly seen as a major weakness (HMSO 1988). This narrowness is expressed by the fact that the majority of those on the academic track can restrict their studies after 16 to science and mathematics or humanities/languages alone. The International Baccalaureate, Scottish Highers, as well as most post compulsory curricula on the European continent offer a much broader curriculum with a generalist rather than a subject-specialist focus. A parallel distinction between narrow and broad curricula can be made in describing English and continental vocational qualifications. English vocational qualifications, even when they are not occupationally specific, tend to limit the horizons of students to particular occupational areas, whereas continental models adopt a Baccalaureate-type approach combining occupational and general education (Watson, 1991).

In the English context, the issue of specialisation has usually been posed in terms of the absence of any kind of framework, such as is provided by the Abitur or Baccalaureat, and trying to compensate for the unique narrowness and exclusivity of single subject Advanced levels. Virtually every other country has some form of bacclaureat or matric. However, this is to concentrate only on the peculiarities of this country and neglects a second dimension of specialisation, namely the separation of knowledge from its application through academic/vocational divisions. Furthermore, concentration on subject and vocational specialisation can all too easily lead to a simplistic view that equates academic/vocational divisions with specialisation and assumes that a unified curriculum would be generalist and less specialist.

The alternative approach that will be adopted in this paper is to recognise that the pressure to shift away from subject and vocational specialisation arises from deeper changes in the *form of specialisation*, not just as it appears in the curriculum, but in the wider division of labour and occupational structure of society. The *British Baccalauréat* proposals for a unifed curriculum are not a trend away from specialisation, but a move towards more integrative *forms of specialisation* which are not based on either insulated subject divisions or academic/vocational divisions. In curricular terms this suggests the possibility of developing new connective skills and understanding and the ability to innovate and to apply and use learning in different contexts. In *The Work of Nations* Reich refers to such knowledge as

symbolic analysis and, from a slightly different perspective, Zuboff in *In the Age of the Smart Machine* refers to *intellective skills*. Such curricular priorities are frequently expressed by leading edge companies (e.g. British Telecom, 1993). Before exploring these possibilities for a *curriculum of the future*, it is necessary to consider why specialisation is such a crucial issue in post compulsory education at this time.

4. Specialisation as an Integral Aspect of Modern Economies

A high level of specialisation is an integral aspect of the state and economies of modern societies, and it is a crucial reason why such societies have been so vastly more productive than those that they replaced. The first substantial increase in specialisation occurred with the emergence of the modern state in the last decades of the 19th century. It developed further through the expansion of industrial economies in the 20th century with the growth of mass production. As Piore and Sabel (1984) put it:

> the extensive division of labour in mass production (was characterised by) both the break between conception and execution of tasks and the highly specialised character of almost all production jobs.

The consequences for the newly emerging system of mass education were twofold. Curricular specialisation was fuelled by the rapid development of knowledge expressed in the growth of and divisions between new subjects and vocational areas. At the same time school-based 'education' and work based 'training' became increasingly separate as the development of mass production:

> made it possible (for the system of production) to rely on two separate institutions for training employees: the formal education system and the firm itself. The formal education system . . . providing abstract knowledge of products and production . . . the firm (providing) training for the fraction of the workforce that needs skills . . . (Piore and Sabel, 1984).

Thus the main features of what will be referred to as *divisive specialisation* were established – the divisions between academic subjects and the separation of education and training.

5. Mass Production and the Development of Divisive Specialisation

The correspondence between education and the economy has always been somewhat tenuous. Education is shaped by many historical mediating influences other than the economy or its leading productive processes. The parallels that can be drawn between economic organisations and the curriculum in the era of mass production, may relate less to the direct influence of the economy and more to how the economy and the education system have themselves been shaped by different cultural and political histories (Green 1991).

In England and Wales the new social divisions between managers (nearly always owners at this time) and factory workers emerged in the early 19th century in an environment still culturally and politically dominated by the feudal aristocracy and, in the new factories, by the traditional artisans who controlled the tools and new machines. The education of craftsmen took place almost entirely within the apprenticeship system and developed separately from the growth of mass elementary education. Thus the terms were set for the early and sharp separation between academic study and vocational education which was to become the basis for the uniquely *divisive* form of specialisation that was to emerge in England and Wales.

Relations between the expanding industry and services in the late 19th and early 20th century and the education system were mediated by a divided qualifications system consisting of two largely separate tracks: an academic track dominated by subject-specialisation and terminal examinations and an occupationally specific vocational track, until recently consisting of work-based apprenticeships. Such a selective system also ensured that large sections of the population received only elementary education and had no access to qualifications of any kind.

It was not until the 1980s that a British government decided to rationalise vocational qualifications and the attempt to extend them to the majority of the working population. The method it has adopted has been through the precise specification of job competences. This is somewhat ironic, given that it is occurring at a time when systems of production based on such a rigid specification of jobs are increasingly being questioned as the continuing basis for productivity. In the 1990s the system of qualifications and curricula for post compulsory education in the UK can be seen as at a point of contradiction. There are (largely political) forces committed to maintaining inherited divisions with their powerful selective and restrictive functions, and there are the growing demands (largely industrial and professional)

for a broader curriculum as the basis for educational expansion. Increasingly, the latter recognise that such expansion is not possible within a divided system.

These contradictions do not just express the problems of expansion and how a curriculum dominated by selection can be geared to increases in participation. They also raise the question, mentioned earlier in this paper, as to whether a divided curriculum can deliver the kind of skills and knowledge that are going to be needed if the country is to be competitive in the economic climate of the 21st century. In order to gain some insight into what the new combinations of skills and knowledge might be it is necessary to review briefly the arguments about current economic changes and how they are expressed in changes in the form of specialisation. It will then be possible to consider their implications for the curriculum in more detail.

6. New Concepts of Specialisation in the Economy and Education

The idea that we are in at the beginning of a new post-Fordist era is much contested and its possible forms and destinations are far from clear. Different analyses give different emphasis to cultural and economic changes. This paper is primarily concerned with the latter, in particular with changes in the organisation of work and the structure of occupations. The emergence in the economies of advanced capitalist countries of what has been termed 'post Fordism' has been widely commented on. 'Post Fordism' is a rather loose, albeit evocative, term which refers to the appearance of a collection of industrial innovations, such as flexible specialised production, new uses of information-based technologies, flatter management structures, and the new emphasis upon teamwork. Mathews, Hall and Smith (1988) describe the changes in this way:

> The industrial system that has dominated the twentieth century – a system based upon mass production, mass consumption, Taylorised fragmentation of work and deskilling – is visibly dying, and creating economic chaos as it is forced from the historical stage. A new industrial system is being born – based upon technologies of microelectronics and new materials, intelligent production, human-centred organisation, worker responsibility and multi-skilling. The *forms of specialisation* within the economy are in fact changing. They are reversing the concept of mass production and introducing the process of 'flexible specialisation'.

> Flexible specialisation involves the combination of general purpose capital equipment and skilled, adaptable workers to produce a wide and changing range of semi-customised goods. Manufacturing flexibility and market responsiveness go hand in hand, allowing companies to tailor their output to sales trends and carve out new market niches by adapting products to customer needs.

The actual extent of such developments and their likely extension in particular countries is open to question, as are their social consequences. What is not in doubt is that changes from a system of mass production to one based on flexible specialisation makes quite new intellectual demands on employees at all levels. The social, intellectual and essentially *educational* basis of the new forces of production are well recognised by Castells (1989) when he states that it is the

> structurally determined *capacity of labour* to process information and *generate knowledge* that is the material basis of productivity and the (modern) source of economic growth. Yet this symbolic capacity of labour is not an individual attribute. Labour has to be formed, educated . . . etc.
>
> . . . In addition . . . social institutions . . . and the overall structure of society . . . will be key elements in fostering or stalling the new . . . productive forces. The more a society facilitates the exchange of information flows, the decentralised generation and distribution of information, the greater will be its collective symbolic capacity.

But the argument can be taken further. A high-participation education system linked to a high-skill system of production would require a curriculum which was congruent with it. In other words, it too must exhibit features of flexible specialisation. Hickox and Moore (1991) make the point that it may only be in the 'post Fordist' phase, with the vastly increased pressures on industrial capitalism, that we can begin to talk with any realism about a correspondence between education and the economy. They see managers of the future having to learn that their only new sources of productivity are the potential intellectual capacities of their employees.

The new forms of work organisation associated with flexible specialisation set quite new criteria for the curriculum. Instead of the traditional screening role of academic/vocational divisions, the emphasis would be on new and innovative kinds of connectiveness between knowledge areas and different forms of specialised study interwoven with a generic core of knowledge, skills and processes. It is

debatable whether such criteria, despite their origins in the demands of new occupations, should be described as a modern version of general education or a form of vocational education.

In curriculum terms there are two key issues: *flexibility* (the opportunity to make choices and combine different kinds of learning in new ways) and *coherence* (the sense of clarity that a students need in order to be clear about their educational purposes and where a particular course of study (or cluster of modules) will lead to. In the *British Baccalauréat* we concluded that this combination of flexibility and coherence could be achieved through a modular curriculum, provided there were also a clear set of pathways or routes for students to identify with. This model of the curriculum has some parallels with new forms of network organisation in which teams of employees are given maximum autonomy within a clear set of overarching purposes (Morgan, 1988) and in some recent educational developments (Young, 1993).

It is not surprising that the educational implications of this new era have been interpreted as being 'anti-specialisation' – particularly with the recent emphasis upon generic problem-solving and the dissolution of curriculum barriers (Brown and Lauder 1991). However, as was mentioned earlier, the change is not away from specialisation, but towards new forms that can (at least in principle) free specialisation from its association with selection and insulation. *The separation of specialisation from its association with divisions and the insulation of subject areas is the key basis for distinguishing between a divided curriculum or 'curriculum of the past' and a 'curriculum of the future'.* This is the key point of this paper, and one that I will come back to.

The issue of specialisation is central to whether changes in industrial economies can be the basis for a new curriculum. The productivity of industrial capitalism up to the middle of this century depended on what is termed here *divisive specialisation* – or increasing the division between mental and manual labour as the specialist engineers and managers designed systems of production which depended less and less on the skills and knowledge of the majority of employees (Noble, 1979). This system was the most productive the world had ever known and, as knowledge grew, specialisation took the form of the principles of scientific management being applied to more and more areas of manufacturing, service and other sectors. It is this system of production and its dominant form of divisive specialisation that is under challenge from systems that depend on maximising the innovative contribution of all employees (Prospect Centre, 1991/ National Education Commission 1992). The origins of this change are twofold: the 'globalisation' of economies and the massive increase in

the potential for competition that goes with it, and the transformative potential of information-based technologies.

A form of work organisation which seeks to maximise the intellectual potential of all employees cannot rely on a curriculum that limits itself to providing a small proportion of the population with highly specialist knowledge, while, at the same time, disregarding the level of performance of the majority. Again, Piore and Sabel (1984) make the point clearly when they state that in production based on flexible specialisation:

> designers must be so broadly qualified that they can envision product and production together (something not learnt by) book learning alone (Piore and Sabel 1984)

and:

> Production workers must be so broadly skilled . . . to be able to collaborate with designers to solve the problems that inevitably arise in production.

In other words, specialisation has to become part of another paradigm of what is elsewhere referred to as *connective* knowledge and skills, and the increased scope for choice, personal flexibility and high performance that enables the highest possible number of people to innovate in a constantly changing world. This 'flexible' or 'connective specialisation' contrasts sharply with the 'divisive specialisation' that underpins academic/vocational divisions. Before exploring further the idea of *flexible (or connective) specialisation* as a curricular concept, it is necessary to discuss the curricular implications of the dominance of *divisive specialisation.*

7. The Language of Divisive Specialisation and its Curricular Implications

One consequence of inheriting a deeply divided system in which academic and vocational tracks are so embedded in the institutional and social structure is the absence of any embracing concepts to describe knowledge and skill development. Without such concepts it becomes difficult to extend the idea of flexible specialisation in curriculum terms. The comparison between the vocabulary and concepts available in English with the potential of the French terms 'formation' and 'qualification' and the German term 'bildung' are very striking. In English, most of the terms and concepts which we have for discussing education and training, though never precisely defined, have limiting and often highly divisive meanings. They were

established in the discourse and institutionalised in the last part of the 19th century but remain extremely powerful. It possible to list some examples as follows:

knowledge – which usually refers to academic subjects

science – which, unlike in German, refers to the natural sciences

technical – in relation to education is invariably associated with manual work and low status occupations

academic – meaning detached (but with high prestige)

vocational – defined as non-academic and relating to specific occupations)

skills – associated with the manual activities of craftsmen

competences – defined in terms of observable performances

This is the vocabulary of a deeply divided system. It is also the vocabulary of a society deeply rooted in its past, with limited intellectual resources to change or even to come to terms with the present let alone the future.

A further consequence of the power of academic/vocational divisions as a dominant form of specialisation in the United Kingdom is the extent to which rigour and standards, which are associated with the highly selective Advanced levels, have been separated from both personal and social education and preparation for future employment (which then get associated in curriculum terms with academic 'failure'). This association of rigour with academic subjects and their forms of assessment is well exemplified by the current attempts to give General National Vocational Qualifications parity of esteem with A levels through requiring externally set and marked tests. A curriculum of the future has to bring together the aims of rigour, relevance and personal development, which appear so irretrievably separate in a divided curriculum.

Although it is difficult to find examples of *flexible specialisation* in this country, this does not mean that the process of specialisation, albeit within the divisive form, is not changing. I will describe these changes in terms of the distinction between *sectional* and *corporate* forms of *divisive* specialisation. They refer to horizontal and vertical developments within and between occupational groups. I shall use these forms of divisive specialisation to contrast with the possibilities of *flexible* (or *connective*) specialisation.[2]

8. Forms of Specialisation and their Curriculum Implications

The *sectional form of divisive specialisation* refers to how, in response to changing circumstances, members of professions and groups of craftsmen within an occupational area traditionally identify with their fellow professionals or craftsmen and form associations (and trade unions). In curriculum terms it describes the associations of academic or vocational subject specialists, many of which were established at the turn of the century. Exaggerated subject specialisation is characteristic of the divided curriculum and is particular strong in England where it has been described by Bernstein (1971) in terms of the concepts 'strong classification' and 'collection code'.

The curricular priority which characterises the *sectional form of* divisive specialisation is an exclusive concentration on subject-specific content. However, this is not an inevitable feature of the behaviour of subject specialists or craft teachers. It refers only to their historically insulated forms of organisation in a divided curriculum. In the context of the much broader notion of educational purposes associated with what is elsewhere described as a 'curriculum for the future', identification with subjects and occupational areas can become the basis for developing teams of *flexible* (or *connective*) specialists (Spours and Young, 1991)

Corporate specialisation is illustrated by a number of developments that can be found in both the economy and in education that are expressions of limited vertical integration. In industry it refers to how different specialists (both craft and professional) and also employees and senior managers can, in the face of external threats (e.g. global or even national competition), identify common purposes beyond their 'sectional' interests. It is much more frequently in evidence in countries other than the UK, as is indicated by the frequent reference to examples of co-determination between unions and employers in Sweden and Germany. This is partly because in the past in the UK employer/union relationships were so often adversarial. More recently, it reflects the extent to which such relationships have been actively discouraged by government.

The two main curriculum priorities of the *corporate* form of specialisation are the broad notions of integrating natural and social sciences which bring groupings of subject specialists together, and the idea of transferable (or 'core') skills which transcends and complements occupationally specific or subject-based knowledge. The former developments have, as discussed earlier, been limited by government determination to maintain the selective function of Advanced levels as

single separate subjects. The idea of core skills has been widely supported by business and industrial as well as educational interests (CBI, 1989 and 1993) and has been a basis for collaboration across the education/industry divide. As with forms of subject integration, the implementation of core skills has been profoundly limited by the divided system of qualifications. (Young 1991).

The *corporate* form of divisive specialisation can be seen to represent a transitional and even contradictory phase of divisive specialisation. It is transitional in the sense that its curricular priorities have emphasised breadth and the idea of 'core skills' in ways which go beyond the traditional forms of divisive specialisation. It is contradictory to the extent that the broad notion of skills that is being sought after in potential employees by leading edge companies (British Telecom, 1993) is very different from the narrowly defined job specific concept of a vocational qualification or even the numeracy and literacy that employers are supposed to want.

In developing their concept of *flexible specialisation*, Piore and Sabel (1984) write about 'envisioning product and production together'. In relation to the curriculum, I prefer the term *connective specialisation*, as it refers explicitly to the interdependence of different specialists and contrasts with the insularity of traditional subject specialists. It refers to the importance of specialists, whether physicists, designers or guidance staff (to take only three examples) sharing an overall sense of the relationship between their specialisation and the whole curriculum. In other words, whereas divisive specialists see the curriculum from the point of view of their subjects, connective specialists see their subjects from the point of view of the curriculum.

In the sense used here, connective specialisation is concerned with the links between combinations of knowledge and skills in the curriculum and wider democratic and social goals. At the individual level it refers to the need for an understanding of the social, cultural, political and economic implications of any knowledge or skill in its context, and how, through such a concept of education, an individual can learn both specific skills and knowledge and the capacity to take initiatives, whatever their specific occupation or position.

In the context of such a deeply divided curriculum as in the UK, it is not surprising that it is difficult to find evidence of connective *specialisation* as a curriculum reality. As a curriculum concept it points to the interdependence of the content, processes and organisation (Young and Spours, 1992). As a definition of educational purposes it aims to transcend the traditional dichotomy of 'the educated person' and 'the competent employee' which define the purposes of the two tracks of a divided curriculum. One example of an attempt at a more

elaborate definition of connective specialisation is that it should include

> fundamental elements based upon new needs of an age of science, technology and innovation including maths, science, technological studies so that an education system produces . . .

and aim to encourage

> well-rounded, technologically literate citizens who have some insight into the processes of scientific and technological development, and the capacity and will to keep returning to the system to sharpen and broaden their skills and understanding' (Hall, Smith and Mathews, 1988).

To these themes might be added:

- economic, political and sociological understanding as part of the preparation for active and democratic citizenship,
- the development of modern languages and understanding as tools for a new internationalism,
- aesthetic and cultural understanding as a means of becoming 'competent cultural practitioners'.

How connective specialisation will be expressed concretely will vary from country to country and depend on historical circumstances. In England, where divisive specialisation remains dominant, it is likely to be expressed in a variety of local attempts to create *integrating frameworks* and networks (Spours, 1992; Young, 1993). They may taken the form of credit frameworks to assist progression and student transfer, new forms of compact between schools and colleges of colleges and higher education, or groups of teachers writing modules or developing learning resources within shared curriculum purposes. In each case they represent attempts to express the curriculum aims of *connective specialisation* within and between institutions when such changes are limited by the constraints of a divided qualification system. There are signs that industrial interests, at least as reflected in the Confederation of British Industry (CBI, 1993) are going beyond their traditional positions and arguing for overarching qualifications and credit transfer.

9. Summary and Conclusions – A Curriculum for the Future?

The aim of this paper has been examine analyses of changes in work organisation and the economy and to suggest that they point to a new

basis for overcoming the academic/vocational divisions that dominate the post compulsory curriculum in England and Wales. Starting from the narrow and exclusive form of curriculum specialisation found in England and Wales, the focus of the analysis has been on the theme of specialisation and the interdependence of changes in the *forms of specialisation* in the economy and the curriculum.

The post compulsory curriculum in the UK is analysed in terms of the concepts *divisive* and *flexible* (*or connective*) *specialisation*. The major features of *divisive specialisation* as found in England and Wales are identified as:

- sharp academic/vocational divisions
- insulated subjects
- absence of any concept of the curriculum as a whole

Two forms of divisive specialisation, the *sectional* and the *corporate*, are distinguished. These concepts are used to point to current changes in post compulsory education in the UK.

Finally, it is argued that current economic changes could provide the basis for a very different form of *flexible* (*or connective*) *specialisation* in work organisation and in a curriculum for the future. Such a curriculum, it is suggested, would need to build on and give specificity to the principles of the IPPR's *British Baccalaureat* of:

- breadth and flexibility
- connections between both core and specialist studies and general (academic) and applied (vocational) studies
- opportunities for progression and credit transfer
- a clear sense of the purpose of the curriculum as a whole

At the end of their book, Piore and Sabel (1984) state that whether societies of the future will be based on mass production or flexible specialisation will 'depend in part on the capacity of nations and social classes to envision the future that they want'. This paper can be seen as an extension of their argument by proposing that if this country is to have an economy based on flexible specialisation it has to develop a curriculum that is designed for that future. In the UK, at least prior to April 1992 and the fourth consecutive Conservative Party General Election victory, a unified curriculum along the lines of the IPPR's *British Baccalaureat* had begun to look more and more like the future (Young and Watson, 1992). With such a future now looking very distant we need to remember, as Gramsci wrote, that 'what "ought to be" is concrete . . . it alone is history in the making and philosophy in the making, it alone is politics'.

Notes

1. An earlier version of this paper was presented at an International Workshop on the theme of *Mutual Enrichment of Academic and Vocational Education in Upper Secondary Education*, held at the Institute for Educational Research, University of Jyväskylä, Finland on 23–26 September 1992. The paper is also part of a joint research project with Ken Spours on the theme *A Curriculum for the Future* and represents the development of the ideas expressed in Spours & Young (1992).
2. This distinction between three forms of specialization is indebted to Gramsci's idea of 'levels of consciousness'. The link between levels of consciousness and forms of specialization owes much to Sassoon's (1988) interpretation of Gramsci's ideas.

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