



EDUCATION
TRAINING
Y O U T H

SKILLS FOR A
COMPETITIVE AND
COHESIVE EUROPE

A Human Resources
Outlook for the 1990's

COMMISSION
OF THE EUROPEAN
COMMUNITIES

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EXECUTIVE SUMMARY

1. In this period of transition from the Single Act to Maastricht and beyond, job creation, competitiveness and cohesion are dominant themes of the Community's policy objectives, as is the expansion of international responsibilities. Underlying this is the need to ensure the conditions for a prosperous economy, in order to provide economic and social progress which is balanced and sustainable.
2. Competitiveness is one of the conditions for employment creation. To ensure and maintain competitiveness in an open economy requires Europe to follow three strategies: development of human resources, effective use of future technologies and better exploitation of the advantages of the Internal Market.
3. Competitiveness means competition, and competition is a driving force for economic change, implying a transformation of the industrial fabric and the introduction of new production systems. The process of industrial restructuring and adaptation has already accelerated and will continue in the years to come.
4. Striving for competitiveness is, in the first instance, the responsibility of enterprises. The rôle of policies is to establish a favourable environment for competitiveness, while at the same time ensuring the necessary competition.
5. This Report deals with one of the strategic means to achieve competitiveness, job creation and cohesion: Europe's human resources. Changes brought about by competition are based to a considerable extent on people, their skills and creativity. At the same time the labour force has to adapt to restructuring in the Community's industrial fabric and production systems. As a consequence, geographical and occupational mobility must be facilitated by means of retraining.
6. Ensuring a favourable environment for competitiveness with regard to human resources will need to be based on three key areas of action:
 - anticipation of change,
 - adjustment to change, which needs to be speeded up,
 - adaptation to change in a socially acceptable way.
7. This Report discusses the main trends which are changing production systems. The rôle which human resources play in this is set out, based on a recently emerged consensus between politicians, industrialists and experts on the strategic importance of human resources for social and economic development.
8. As a consequence of the massive changes which can be expected, the skills of Europe's labour force need to be continually updated so as to avoid social exclusion and high economic and social costs. To this end, education, training and retraining should be a priority investment.
9. This Report shows that the labour market is characterised by structural mismatches because of

Skill Shortages in European Regions : Some Examples

Overall skill shortages and unemployment

	<u>% of firms reporting shortages</u>	<u>unemployment rate</u>
Pays de la Loire (F)	68%	10%
Weser Ems (D)	77%	8%
Palermo (I)	71%	23%
Valencia (E)	51%	15%
South-Limburg (NL)	14%	14%
Breman (D)	75%	15%
Central Region (P)	83%	5%

Occupations in particular shortage by region

Campania (I):
skilled manual; salesman/marketing; managers; specialised technical staff for R and D; office staff

Wales (UK):

- professional engineers (mechanical and electrical); electronics technicians; accountants; engineering shop floor workers

Eastern Macedonia and Thrace (GR):

- skilled technical staff; higher scientific - technical executives; managers; office staff; sales staff

Hainaut (B):

civil and industrial engineers; technicians all levels; skilled workers

Central Region (P):

-professional and management; skilled and semi skilled; computer users; office staff; sales staff

Thames Valley (UK):

-middle and supervisory management; professionals; skilled and semi skilled-workers

Source: EC Regional reports (surveys were carried out in late 1990/early 1991)

inappropriate skills and, as one consequence, growing structural unemployment. Labour force skill deficits and obsolescence have become apparent and remain despite high unemployment. Furthermore, changes under way and those foreseeable in technologies and work organisation resulting from competitive pressures will require significant changes in skills profiles. Industrial restructuring also calls for individuals to become equipped with new skills and qualifications.

10. To overcome existing skills deficits and to respond to future skill requirements will require a massive investment in both education and training of young people and retraining of the existing workforce. At the same time, this action will provide a part of the necessary infrastructure for a competitive industry and thus contribute to the required employment creation.
11. Given the magnitude of the challenges facing the Community, decreases in the share of national income devoted to education and training cannot be a suitable response, especially in the less developed regions and Member States. Indeed, an inadequate investment in education and training would impose high economic

and social costs. Only shared responsibilities between individuals, enterprises and the public sector can achieve the necessary levels of financing.

12. Fortunately, there is no need to create new education and training systems in most cases. Efforts to increase their efficiency and quality will be important. New relationships between existing structures, more flexible forms of access to the various types of education and training, more flexible systems of qualifications and new ways of cooperation between all actors, including special provisions for SMEs, are urgently called for.
13. Human resources are the foundation on which our well-being is built. To master the challenges of today and those of the future requires forward looking investment in physical and human capital. The economic and social cost of a neglect of investment would decrease Europe's competitive position further and thus reduce the basis of its welfare, at the same time reducing the means for strengthening economic and social cohesion.

Part A: Human resources - A key to master the challenges ahead

1. Human Resources and Development

1.1. A New Consensus

A new consensus has emerged on the importance of human resources as a pillar of economic growth.

The early 1990's have seen the emergence of a rare world-wide consensus amongst economists and policy-makers concerning the central role of human resources - and hence of education and training - in economic progress. This is reflected in the reports of many international or national development agencies in the early 1990's: the 1991 World Bank Development Report, the 1991 OECD Synthesis Report on the Technology/Economy Programme, and various documents of the European Commission, such as those on Industrial Policy in an Open and Competitive Environment (COM (90) 556), on skills shortages in Europe by the EC's Industrial Research and Development Advisory Committee (IRDAC), the Commission's Memorandum on Vocational Training in the European Community in the 1990's (COM (91) 397) and the Guidelines for Community Action in the Field of Education and training (COM(93) 183).

All reflect the basic agreement, shared by employers and trade unions, scientists and politicians that human resources will play a strategic role in achieving the objectives associated with the type of society which Europe, its policy-makers, its citizens and its social groups wish to see developed.

1.2. Economic Evidence: The New Growth Theory

Even more remarkable is the consensus among economists following the emergence in the 1970's and 1980's of the so-called "New Growth Theory". In the 1950s and 1960's, growth theories emphasized physical investment in capital equipment, while tending to consign education, training and research ("technical progress") to the role of an exogenous "residual factor".

The new growth models embody the growing recognition that it is "intangible investment" - in education, training and technical change - which is at the heart of the

development process. Investment in knowledge is seen as important as investment in machines in economic models for analytical and theoretical purposes. Such models are supported by statistical evidence: lack of investment in human capital (poor education and training), rather than the lack of investment in physical capital, would appear to be the main factor inhibiting poor countries from catching up with rich ones (see studies by R. Barro, Harvard), and even accounts to important extent for the low level of productivity in part of the United States' economy as compared with Japan. The broad policy implication is that investment in human capital has to accompany the investment in new machines if the potential productivity gains are to be realised.

1.3. Striking examples

The competitive strength of Japanese and East Asian firms in tradable goods has been a major factor in the growing recognition in the EC and the US that education and training are key factors in economic development. The remarkable success of Japanese firms in world markets is having a salutary effect, and most reports single out the point that basic education and continuous in-house training and retraining are one of the principal sources of Japanese competitive strength. A further recent example is the success of the East Asian "Tigers", which can be attributed clearly to the crucial role of education and training, especially in engineering.

Similar observations as to the importance of "intangible investment" arise from the World Bank's 1991 Development Report as well as from the above-mentioned OECD report, particularly its conclusions which stress lifetime education and re-training. Reflecting the speed of successive new generations of technological change, the report to the EC on the Employment Implications of Information and Communication Technology (1991) sends the same messages. The European Commission, in its communication "From the Single Act to Maastricht and Beyond" (COM(92) 2000), underlines the important role of human resources and thus education and training, for both cohesion and competitiveness, two of the key issues for the Community in the years to come. Again this confirmed by the Communication on a "Community-wide framework for employment" (COM (93)238) and the Conclusions of the

Copenhaguen European Summit.
 Thus, the well-being of Europe's people, today and in the future, depends on the strong competitive position of Europe in an open world economy. To achieve this

will require an equilibrium between high levels of skills, innovation, quality, productivity and income.

2. Europe's Competitiveness at Stake

A competitive Europe depends on a high skills strategy.

Over the 1980's, Europe's competitive position has weakened compared with its main competitors USA and Japan, as indicated for example by R and D investments or by the proportion of high-technology goods in exports (see the EC's 1991 and subsequent Annual Economic Reports). The importance of competitiveness in hightechnology activities in particular is that they generate high quality, high value-added and knowledge-intensive jobs, which are usually less demanding on the environment than traditional material-transforming, energy-consuming sectors. European enterprises, and the European economy as a whole, will face ever growing competitive pressure in the years to come because of the completion of the Internal Market and increased international trade liberalisation (the objective of the GATT talks in the Uruguay Round).

To rise to this challenge of competitiveness in global markets, Europe must increase efforts towards

productivity, innovation and quality, and ensure through appropriate policies a favourable internal environment for industry. A high skills strategy, involving an increase in the quantity and particularly the quality of education, training and retraining will be needed to sustain a rapid pace of industrial change and adaptation. The main components of this strategy are set out below.

2.1. Mastering Changes in Technology and Work Organisation

Technological change and the organisation of production must go hand in hand.

Major structural change is taking place in all industrial economies, brought about by the diffusion of new technology. This change is likely to accelerate. But Europe's comparative disadvantage in several high technology sectors lies in the poor record in many Member States in successfully commercialising new technology and diffusing its production. Three main

Old and new models of industrial organisation

FORDIST MODEL

- 1) Rationalisation of labour by mechanisation
- 2) Design and then manufacture and organise work
- 3) Indirect mediated links to consumers
- 4) Low cost by standardisation quality comes second
- 5) Mass production for stable rising demand and batch production for unstable
- 6) Centralisation of the production management
- 7) Vertical integration with circles of sub-contractors
- 8) Use sub contractors to stabilise cyclical demand fluctuations
- 9) Divide and specialise production tasks for productivity gains
- 10) Minimise skill and training Continuous training and education requirements
- 11) Hierarchical control higher wages to get consent to poor job content
- 12) Adversarial industrial relations Collective agreements to codify provisional armistices
- 13) "Full employment"

Source: MERIT

NEW MODEL

- Global optimisation of whole production flow
- Attempt to integrate R & D, Design, Production
- Close ties between producers and users
- "Zero defect" objective at each stage
- Flexible fast response to market whether batch or mass
- De-centralisation of production decisions
- Networking and joint ventures to reap gains of specialisation and coordination
- Long-run cooperation with chosen sub-contractors
- Integrate some production maintenance and management tasks ("re-compose")
- Continuous training plus general education to maximise competence
- Human resource policies to spur the competence and the commitment of workers
- Explicit long-term compromises between management and workers; via job tenure and/or sharing dividends
- "Active Society"

technology “clusters” have had or will have important implications for production systems in wide areas of the EC’s economy: Information and Communication Technology (ICT), New Materials and Biotechnology. They are characterised by their pervasiveness, as is the environmental dimension of production and consumption, i.e. leading not only to the rise of new industries but affecting existing industries and services. This requires innovation in production systems including work organisation. It can be expected that biotechnology and new materials could become as important in the future as ICT is nowadays.

The best known example of a pervasive technology is Information and Communication Technology. It is now universally accepted that the “chip”, the computer and new developments in telecommunications are together transforming almost every branch of manufacturing and, what is perhaps even more important, virtually every branch of the service industries.

What is not so widely appreciated is that, accompanying and underpinning this technological revolution, there is also an organisational revolution. It is the interaction of the new technologies with the new model of management which is bringing about such a dramatic transformation in the skill profile of the workforce (see previous box). Changes of this kind are taking place in most sectors and in most countries although at different speeds. They call for significant investment in higher levels of skills, starting from basic education through to initial and continuing training.

2.2. Quality for Competitive Advantage: A Key Issue in the 1990’s

The quality of production and consumption is a vital consideration for enterprises.

In the past decade, efforts concentrated on rationalisation and automation in order to increase productivity, and important determinant of unit labour costs and thus price competitiveness. The strategic means to achieve this was to invest in fixed capital. To be more productive and competitive in the 1990’s will call for greater emphasis on improving quality and innovation through investment in education and training for skills.

Quality, as the term is used here, has four dimensions: 1) to reduce defects in production and cut costs (quality management), 2) to meet the different customers’ needs (customisation), 3) to organise production to facilitate flexible responses to fast changing market conditions (flexibility), and

4) to restructure production in order to achieve environmentally-friendly processes and products (sustainability).

Changes in work organisation are bringing a responsibility for quality into every single job or task as part of a total quality strategy. One aim is to prevent defects before they could occur. As important will be those efforts of enterprises which are directed at getting closer to customer demand using strategies of product and market differentiation. This involves both geographical diversification and production for different market segments.

Quality is also becoming an important element in the production of high value-added output. Quality and customisation are especially prized in many areas of personal services, given that opportunities to increase physical productivity in services are limited and countries elsewhere in the world may be able to produce services with lower labour costs.

It has also become more and more important for successful enterprises to react quickly to shifts in demand. In addition to the above-mentioned changes in work organisation, a powerful and sophisticated information network is a prerequisite for increased flexibility. Adaptation and re-training of the labor force will be necessary to achieve it.

A consensus is emerging in Europe between representatives of industry, the Social Partners and politicians concerning the concept of sustainable growth, which emphasises ensuring competitiveness and comparative advantage via an emphasis on quality. This approach results from pressure of public opinion, shifts in consumer demand and environmental regulations. The environmental dimension will become a major transforming factor in a manner analogous to Information Technology, pervading a large number of tasks and the techniques and technologies of all economic sectors. Furthermore, it can be assumed that processes and products, characterised by increased quality in terms of more environmentally friendly design, will occupy a growing place in world-wide demand.

An early re-orientation of EC industries towards sustainability could lead to significant competitive advantages. To achieve this requires qualitative changes in the whole production chain, starting from research, development and application through to production, use and disposal - with major implications for skills and training.

Industry and sustainable development

A report of the European Round Table of leading industrialists states:

“Sustainable development is the subject of many dialogues between industrial, governmental and environmental groups. It has been defined by the World Commission on Environment and Development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It is closely linked to a controlled depletion of non-renewable natural resources, to respect for the environment, and to thinking about the world that will be inherited by future generations.

The introduction of sustainable development will have a

revolutionary effect as far-reaching as the introduction of steam, electricity and electronics in their time. It is above all an intellectual revolution. For it to succeed, a massive and concentrated effort in training and education will be needed to integrate environmental concerns into corporate strategy. It will affect everybody in the company, from top to bottom.

Company training programmes for both technicians and management should absorb this concept and apply it globally. The slower-moving university world could also be mobilised speedily and effectively within the framework of existing cooperative programmes partly financed by industry. (Reshaping Europe, page 37)

2.3. Globalisation and Regionalisation: Ensuring the competitive home-base

Local, regional and national markets and networks provide the environment for globalisation of competition.

Increasingly, bigger enterprises (and many medium-sized enterprises) have extended, and will continue to extend, their activities in order to operate within wider geographical areas (and ultimately in the world market). This development concerns not only the supply of goods and services, but also such strategic decisions as location of plants and choice of suppliers. Another factor is the emergence of global financial markets which increasingly are operating outside the direct control of individual governments or Central Banks.

These trends are strongly supported by the development of transport networks and of highly sophisticated and rapid communications systems. The movement towards globally-based activity is related to problems and challenges which are of a world dimension and thus have to be tackled within an international framework.

So forward-looking industries are building up strategic partnerships with other businesses around the world, and especially within the EC. These involve for example closer cooperation on research and development. Small firms in particular can regard such networking as a way of obtaining economies of scale in certain areas of their operations. But world-wide operating is not necessarily linked to uniformity of products and production systems. For example, most location decisions still result from the desire somehow

to be close to the customers' needs.

Moreover, there is growing recognition of the importance of the local, regional and national markets for the competitiveness of enterprises and nations. One argument is founded on the “home-base” analysis of Porter (The Competitive Advantage of Nations, 1990), pointing to four essential (and interactive) conditions for competitiveness: high quality human resources and physical infrastructures; a sophisticated domestic demand; competitive local suppliers as well as complementary industries; and the presence of strong local competitors. The more these conditions are met the stronger the general, and even global, competitiveness of a nation's industry.

The above is supported by studies on regional development. Two factors seem to be important. Firstly, the existence of well developed regional networks between enterprises themselves and also between enterprises and training providers, industrial federations, public authorities, schools and universities, and support agencies especially for SMEs. For example there is a trend towards the creation of networks between firms and their sub-contractors. This applies not only for standardised mass-production of components, but in the same way for some high value added, highly specialised and sophisticated parts of the production process, for example in R & D. Another example is the development of effective interfaces between all those concerned with responding to changing skill requirements (see box). These interfaces are not yet equally well-developed in each Member State but many examples of successful interfaces can be found. Secondly, a strong technical orientation developed especially by SMEs, together with a vocational

Examples of effective regional interfaces

Initiatives to create and develop a supply-demand interface in markets for training are to be found throughout the EC. Each interface is different in organisation, style and purpose. Here are a few examples:

1. Sophisticated attempts to deal with the persistent and continuing skill shortages of the 1980's have been made by the Danish Metal Workers Union and the Employers Federation. They have carried out a series of joint research projects followed by coordinated implementation programmes over the period. Both demand and supply representative organisations have a long history of cooperative action in structuring labour markets even at the same time as conflict over wages and conditions takes place. The initial programme in the early 80s set out the skill needs and their solutions. The second phase in the mid-80s (the JUUST Programme) set out the means to provide, in companies themselves, the management abilities to overcome such problems. The current programme is looking explicitly at employer/union cooperation in a broader context of industry development.
2. Dublin has a well organised tourism structure both in marketing (The Irish Tourist Board) and training (CERT The

Tourism Training Agency). These organise and lobby on behalf of sub-sectors which otherwise would have little voice. CERT acts, in a sense, as a market maker for skilled labour for the industry. On the demand side it undertakes basic research on sectoral and sub-sectoral skill needs and articulates small firms' labour requirements and persuades them to demand higher standards. On the supply side, it encourages institutions to undertake appropriate training and provides modules for schools. Work with schools is seen as helpful in improving industry image and encouraging good quality entrants to the industry in later years. CERT, itself, also undertakes training not provided elsewhere.

3. In the UK, the Thames Action and Research Group for Education and Training (TARGET), in the course of daily contact with industry, acts as a broker linking business to training. TARGET has had the opportunity over the last few months of identifying many of the problems facing business managers and the many positive actions which have been taken to address these problems. TARGET, which also operates a COMETT UETP, coordinated the recent series of EC regional analyses of skills shortages on behalf of the European Commission.

training culture, is required to contribute to regional dynamism. Again, less developed regions need to develop these conditions further.

Taken together the arguments point towards the need to foster a favourable environment for a regionally based industry, in which competition and cooperation between enterprises take place.

2.4. Industrial Restructuring and Adaptation - a Challenge for the Skill of the Workforce

Industrial adaptation calls for a further commitment to human resource development.

Even more than in the past, competitive pressures will lead in future years to substantial changes on two levels:

- i) a general pressure for every single enterprise to increase productivity, innovation and quality by means of changes in processes and products; and
- ii) specific pressures on sectors either in the EC as a whole (following the opening-up of the European market), or in sectors in specific regions in the EC vis-a-vis more competitive rivals in other parts of the Community.

To master these changes, actions based on anticipation, adjustment and adaptation are called for, one of which is retraining.

The first level of change requires high-technology industries as well as traditional sectors to upgrade and update the skills of their workforces, as a prerequisite for higher productivity, innovativeness and quality. A further condition is to be able to master the innovation process in reducing the time between basic and applied R & D, and application in processes and products for the market. Time is an important factor for competitive advantage. Innovative capacity is not only dependent on R & D capability, but also on the ability to build new organisational structures, particularly networks and to generate the professional competences and skills needed for managing the innovation process. In this regard, the EC programmes play an important rôle (see next box). This applies especially to the application of new technologies, as shown above.

The second change, either Community wide or regionally concentrated, requires further attention: the restructuring of a given industry is often combined with productivity gains which outpace output growth, with reduced employment as a consequence. To facilitate industrial adaptation in a socially acceptable way, constructive cooperation between enterprises, trade unions and public authorities is required.

Sectoral evidence of action programmes in education and training

The Commission's services are presently analysing the actual and potential impact of its education and training programmes (COMETT, FORCE, EUROTECNET, TEMPUS, ERASMUS, PETRA) and activities, such as comparability of vocational training qualifications and skills needs analysis, across the range of manufacturing, service and technology sectors. The results so far show the increasingly comprehensive coverage of TFHR work across these sectors, from high technology to traditional products and processes. For example, the study shows COMETT's contribution to a high technology sector like biotechnology and FORCE's work in the restructuring of traditional sectors such as clothing and textiles.

This study was initiated in the context of the provisions of the Maastricht Treaty, especially those proposing the use of training and retraining programmes to facilitate adaptation to industrial change (articles 123 and 127). The objective of the Community Actions Programmes in the areas of education, and initial and continuing vocational training is to complement and add a Community dimension, in conformity with the principle of subsidiarity, to Member States' own such programmes, thereby facilitating structural adjustment and competitiveness, as well as enhancing economic and social cohesion.

Community Action Programmes support a variety of European

Community policy objectives, for example:

- the competitiveness of industry - by developing the education and training infrastructure;
- regional development - for example via the regional consortia of COMETT which link local universities and firms, including small firms, and support the diffusion of new technologies such as information and communication technologies;
- environmental policy - the Task Force work on skills needs analysis has identified skills and training needed to sustain the quality of the environment;
- the realisation of the Internal Market - the work on comparability of qualifications facilitates the mobility of workers.

The programme impact study shows that the guidelines for these education and training programmes enhance the competitive environment for industry without distorting competition within or between sectors. They therefore conform with and complement Community policies to encourage the development of high value-added sectors, which are competitive and innovative.

An important means of achieving this is through training efforts which concentrate on:

- the workforce remaining in the sector who are the primary source of re-organisation and technological change;
- retraining that part of the workforce which can no longer keep or find jobs in the given industry, in order to prepare them for sectoral and occupational mobility.

Here, training should take a pro-active stance, trying to avert unemployment. Of course, especially in those cases where the industry undergoing restructuring has a locally or regionally significant position, re-training the workforce is a necessary but not sufficient condition for securing employment. Education and training provision also should be integrated with the economic and social development of the region in order to relate retraining to the new jobs that will emerge.

Internal Market and sectorial Impact



3. Strengthening Economic and Social Cohesion

Economic and social cohesion implies action at the regional level and a diversity of approach in the European education and training systems.

In this period of transition from the Single Act to Maastricht and beyond, the strengthening of economic and social cohesion remains one of the pillars of the European Community. To reduce disparities between regions and countries, thus improving equal opportunities for all European citizens, is one of the EC's principal objectives. However, greater awareness also is needed of the fact that the Internal Market will result in significant restructuring of European industries.

The less developed regions, as shown by the study "The impact of the internal market by industrial sector: the challenge for the Member States" (European Economy/Social Europe, 1990), are in many cases not well placed to master this challenge. So it is all the more important to strengthen their industrial environment and training infrastructure.

3.1. The Changing Pattern of Regional Policy

In the regions, the emphasis of development policies has changed in the 1980's with a shift from capital-intensive, "dedicated" technologies to flexible, information-intensive technologies. Whereas in the 1960's and 1970's the emphasis was placed mainly on tax concessions and subsidies to make inward investment in plant and equipment more attractive, now much greater emphasis is being placed on developing:

- (1) the communications infrastructure, especially advanced telecommunication networks and transport; and
- (2) a highly skilled workforce with good vocational education and training institutions to maintain and upgrade local skills and meet the needs of employers.

Both of these elements are essential conditions for strong regional development, but this Report is concerned with the second point. Effective regional policies everywhere in the EC now depend increasingly on good vocational education and training systems and these in turn benefit from EC initiatives such as COMETT, PETRA and FORCE and others to create a Europe of equal opportunities, through shared

experience, exchanges of people and information and burden-sharing. Following EC reports, "The Regions in the 1990's" (Luxembourg, 1991) and "Europ 2000", (COM (91) 511) which show disparities in education and training provision amongst the European regions, the European Parliament and the Economic and Social Committee have stressed the need for the reform of the European Structural Funds and, for example, to support this by developing the statistics on education and training and to include investment in education and training.

To achieve economic and social cohesion requires inward investment in less-developed regions to generate spin-off benefits and to create high value-added indigenous activities and firms, and sympathetic policies to generate indigenous economic growth. To this end, the development of a strong technical culture is one necessary condition, which requires a correspondingly high investment in education and training at all levels.

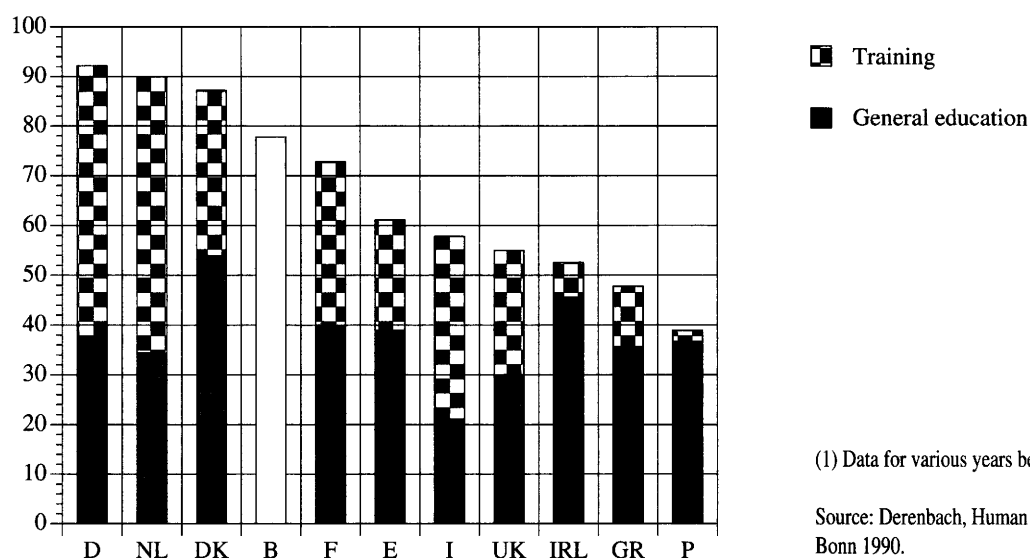
Regions and nations largely remain the main arenas for geographical and professional mobility. However, transnational mobility is contributing to economic development, for example as part of increasing cooperation in and dissemination of technological innovation. So, some labour markets can already be characterised as European. Another example is that of emerging cross-border labour and training markets, requiring cooperation between regions in different Member States.

3.2. Diversity and Common Needs

Studies of technological innovation have shown that a degree of diversity of approach is vital to success. This involves firms, regions and institutions each striving to achieve creative solutions, and new products and processes, in order to become competitive. Dynamic economies are further characterised by effective information flows and cooperation and exchange mechanisms through which innovations can be refined and widely diffused. As a corollary, early standardisation of the approaches used in developing products and processes in many cases can stifle creativity and inventiveness.

The same reasoning can be applied to the different education and training systems in the European Community. Harmonisation of these systems is excluded (see Articles 126 and 127 of the Maastricht Treaty). However, there are some common needs.

Proportion of young people in education training in the Member States (1)



(1) Data for various years between 1984 and 1987.

Source: Derenbach, Human capital and infrastructure, Bonn 1990.

Responses to skill requirements will certainly have to be provided in some way, but the different systems can each offer their own solutions and exchange their knowledge and experience, thereby accelerating the

responsiveness and creativity of the system as a whole. The EC is providing the framework, as in the case of R&D, to undertake some joint activities in parallel with and interacting with local and national activities.

4. Summary

This part of the report started with a general assessment on the role of human resources in social and economic development. Human resources and thus education and training are undeniably playing a prominent role. People are Europe's principal long-term resource. Skills, attitudes and creativeness are the factors which will decide our future. They must be at the centre of any policy agenda.

Next, the chapter examined social and economic challenges in Europe brought about by competition. These include changes in technologies, work organisation and the type of economic growth. Europe has to master these challenges in order to remain

competitive, to improve welfare and to create the jobs needed for all who live and want to work in the Community. Human resources play a dual rôle: in bringing about change in production systems; and, as a consequence, in responding to these changes in smoothly mastering industrial adjustment and adapting to the new skills required.

Thus, two issues are crucial. What are the changing skill requirements resulting from the trends outlined above? Is Europe's labour force equipped with the skills and qualifications needed, and what are the changes required to education and training systems?

Part B: Overcoming skills gaps

Co-existence of high unemployment and skills shortages is a political, economic and social problem of great importance in Europe. In this section, the report examines recent skills shortages as well as past and future trends in the skills and occupations of the European Community as a basis for examining how this "mismatch" problem might be overcome. A range of indicators show a clear shift in favour of skills-intensive occupations and activities in the last fifteen years or so in advanced industrialised countries, together with skill shortages mainly in terms of the quality of human resources. The evidence comes

from a review of existing studies and the Commission's "Skills Needs Monitoring Project" (see box)

Skills shortages always impose cost for enterprises in the form of foregone output, and lower productivity and quality of goods and services; they also constrain the efficiency and effectiveness of public services. Skills shortages therefore impede the potential for growth of sector, regions, and national and international economies and need to be significantly alleviated.

The Skills Needs Monitoring Project of the EC

Skill shortages would jeopardise the potential gains from the Internal Market and must be avoided.

This concern is widely shared by both sides of industry and by Community institutions.

To this end, the Commission has launched a variety of Community Action Programmes, including COMETT (Community Programme in Education and Training for Technology) and FORCE (Continuing Training in Europe). Both programmes involve analysis of skills and training needs. In addition, a special project was initiated in 1990 by the European Parliament and is being carried out by the Commission. It involves an exchange of information on skill shortages, new skill requirements and measures to alleviate shortages. It is based on the COMETT network of UETP's (University Enterprise Training Partnerships) and it involves 31 regions throughout the Community all with different socio-economic structures. More recently, a project has started which will bring together representatives from four regions (from industry and training institutions) in order directly to share and implement solutions to skill requirements on a European level. To ensure the reliability of the information collected and promote the creation of new partnerships, most of these analyses involve public authorities, federations, trade unions and education and training providers. These actions aim:

- to collate information on present skill needs and deficits, future skill needs and hence the demands on education and vocational training in the 1990's;
- to spread this information throughout the Community in order to improve the quality of its human resources;
- to initiate regional and sectoral networks to achieve a better balance between supply and demand in skills;
- to exchange information on best practices to avoid or correct shortages throughout the Community;

At a sectoral level, the Commission has initiated analyses of the electronics industry, textiles, tourism, the retail trade and banking, as well as an assessment of the implications for skills of changes in processes and products resulting from the new emphasis on environmental protection and development of clean technologies. A study on the development of information and communication technologies and their implication for employment and skills has also been undertaken. Studies of new materials are underway as well as one on the costs and benefits of training in enterprises.

At regional and sectoral levels, an analysis of training needs is an integral part of the work of UETP's under the COMETT programme.

5. Occupations and Skills Trends

5.1. Occupational structure

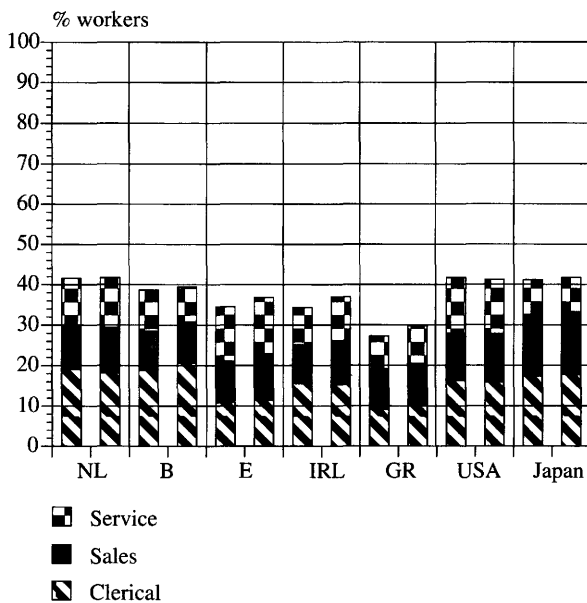
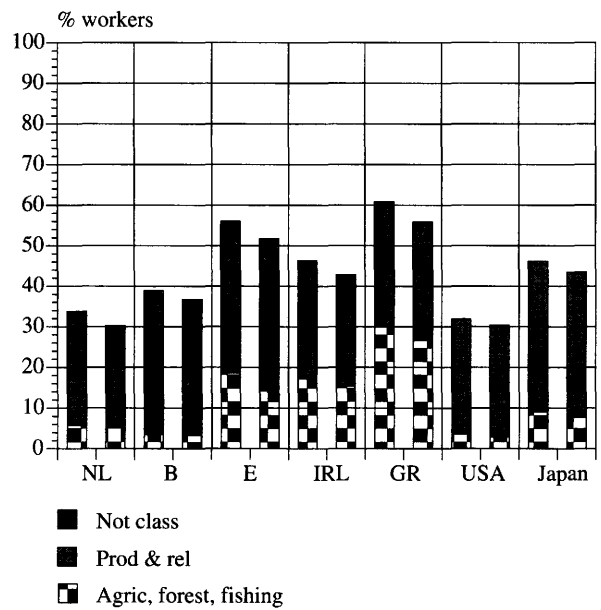
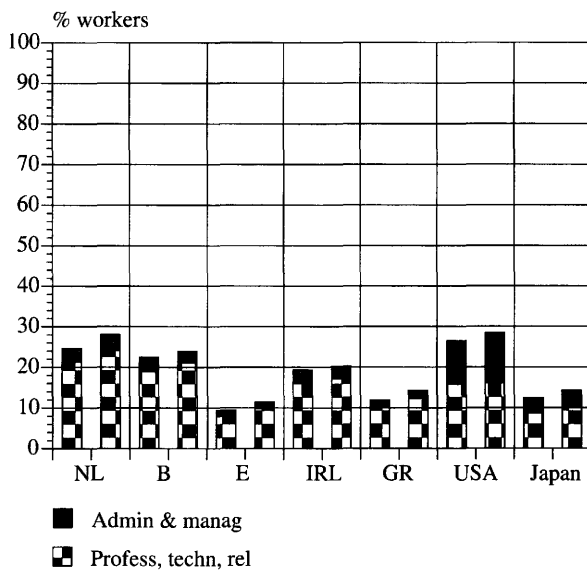
Towards higher skilled occupations in all EC countries.

Indications of recent trends in skill requirements are to be found in data about occupational change which show:

i) there has been an increase in the shares of knowledge-based occupations covering professional technical, managerial and service work in most EC and other developed economies after 1970;

ii) there was a corresponding decrease in the shares of less skilled agricultural, production and transport workers.

Employees by occupation, 1983 and 1988



Left bar 1983, Right bar 1988
Source: ILO

5.2. Skills trends

The skills level of most jobs has been going up.

Factors which have been driving up the skills level of work include:

Global competition: consumer demands need to be met quickly and effectively in view of the growing competition in increasingly international markets. People at all levels in enterprises need to be commercially astute and flexible.

New technologies: higher-order thinking skills to analyse, synthesise and solve problems are required to develop and apply new technologies.

Service industries: there has been a shift towards more jobs in areas like software production, law, finance and telecommunications. A greater need to "customise"

services has resulted in the need for wider skills embracing the design and delivery, as well as the production, of services.

Redesign of work and organisations: decision-making and work responsibilities are being decentralised and are changing working practices based on a rigid division of labour. As a consequence, there is a need for higher-order skills at all levels in organisations. Job redesign has enabled "multi-skilling" of work to take place.

The quality of production is becoming much more important.

The new importance of value-added and customisation has shifted the emphasis from the quantity to the quality of work. These tendencies are evident just as much in Europe as in Japan and the USA and are illustrated by the box comparing the skills (for example in services) of yesterday's and today's jobs.

Skills of today's and yesterday's jobs (services)

YESTERDAY

TODAY

In general, ability to :

1. Hold down a steady job in a rigid organisational context.
2. Do straightforward paper work.
3. Carry out orders.
4. Work alone, apart from others.
5. Work within narrow geographical and time spans.

Adapt to changing products, markets, technologies, and organisation.
Perform abstract work on screen using codes and symbols.
Work unsupervised, take decisions and handle responsibility.
Work in a team, interacting with customers and colleagues.
Cover extended geographical and time spans.

SPECIFICALLY :

Higher level :

1. Generalists.
2. Business and personnel managers (leadership)

Specialists alongside generalists.
High-level technicians, ability to interact and work with customers or colleagues on an equal footing.

Middle level :

1. Specialised production work.
2. Detailed knowledge of procedures.

Multi-skill work involving selling and customer contact.
Comprehensive knowledge of products and markets.

Lower level :

1. Specialised data inputting and processing.

Elimination of routine inputting operations through automation and restructuring.

OECD work has examined expanding and contracting occupations in the 1980's. The growth occupations

(shown in the box on growth occupations) cover jobs with a qualitatively higher skills rating.

Growth occupations

REPORTS OF NATIONAL EXPERTS ON THE FASTEST GROWING OCCUPATIONAL GROUPS IN THE 1980's

Country	Fastest growing occupations	Country	Business services occupations; retailers
Denmark	Construction workers; private sector service workers	Japan	Professional and technical workers; retailers; and clerical and related workers; labourers
France	Clerical workers; retailers; medical and social service	Portugal	Plastic and rubber workers
Germany	Research, training, management and other white collar administrative jobs based on information technology machine repair and maintenance	Spain	Highly-skilled service workers; hotel managers; public services, safety and protection workers; retailers
Greece	Agricultural workers; computer-related occupations; para-medical workers; tourism occupations; construction workers	UK	Highly-qualified service workers; managerial and administrative workers
Netherlands	Managing personnel in administrative functions; directors and managers trade; statisticians, computer scientists; foremen	USA	Technical and professional occupations in the medical and computer fields such as medical assistants, physical therapists, paediatrists, and computer programmers
Ireland	Professional/technical and clerical workers		

Source: OECD

There is a great deal of evidence, from many countries, that skills requirements are changing. Evidence comes from international organisations and from industry,

Some studies have focused on specific occupations in order to identify the skills needed for effective work

performance in a changing business environment. For example, an international programme of research on service industries, by CEREQ/CEDES (Paris 1990) has distinguished the rising quality of skills required first by all workers and then amongst specific categories of workers (see again the box on yesterday's and today's jobs).

Methodologies and definitions

Skills: the concept of skills is a socio-economic one. Skills are defined as the capacity of people to fulfill a job competently and effectively.

The measurement of skills trends is difficult because the total stock of skills cannot be quantified. Assessment of trends in skills in supply and in demand make use of proxy indicators such as changes in the numbers of people in particular occupations.

Skills shortages: there are different types of skills shortages, and different ways of identifying and analysing them. At one level skills shortages are the quantitative difference between the supply of people available for employment in particular occupations and the demand, i.e. labour shortages.

For example, the IRDAC report on skills shortages identified

widespread shortages of engineers and computer software specialists across the European Community. Shortages like these may reflect the dynamism and growth of particular sectors and economies. Surveys of recruitment difficulties amongst certain occupations give an indication of skill shortages. But, as they are focussed on recruitment activity rather than labour utilisation, they are less effective in showing the precise mix of skills required in particular occupations.

An equally serious issue is when skills shortages relate to the extent to which education and training provision fails to equip people with the skills they need to respond effectively to the quality of work which is required. For example, employed workers, just as much as many unemployed people, can be unable to use modern technologies to their best effect, and therefore cannot cope fully with the demands of modern working methods.

A report, from the European Round Table of Industrialists ("Education for Life", 1989) concentrated on managers. It found that the importance of their work has been vastly enhanced in the last decade, and this tendency will continue during the 1990s - a period likely to be characterised by uncertainty and change.

The study identified the following skills as vital for organisations to effectively manage change: market orientation, persuasion and communication, teamwork, organisational awareness, cultural sensitivity and results-orientation. More recently, the European Round Table added "linguistic skills (three languages)" and "continuous self assessment and upgrading of skills" to the list of skills needed by European managers (Reshaping Europe).

Skill requirements in the service sector have changed a great deal in the 1980s ...

An OECD study ("Human Resources and Corporate Strategy", by Bertrand and Noyelle, OECD, Paris 1988) of service industries in France, Germany, Japan, Sweden and the USA, identified the skills which increased in importance in the 1980's. These were: new methods of behaviour, product and market knowledge, and entrepreneurship.

...even in previously lower skill areas like clerical work.

A UK study ("Create or Abdicate", by A. Rajan) on fast growing service industries found that the skills repertoire of clerical work has increased in breadth and depth: breadth, in terms of the number of skills that are required; and depth, in terms of the intensity of their use in everyday work. In the 1970's, clerical workers were expected to have three types of skills: function-specific skills, keyboard skills and procedural skills. By 1988, five types were expected:

- keyboard skills, for effective interface with new technology;
- diagnostic skills, for problem solving and rapid action;
- knowledge-based skills, for marketing and selling of products;
- social skills, for effective inter-personal communication;
- and entrepreneurial skills, for ensuring the commercial viability of enterprises.

Manufacturing industries need far more sophisticated skills.

In manufacturing, occupations like craftsmen and technicians have also become multi-skilled. Workers in

these occupations are increasingly acquiring mixtures of electrical, electronic, mechanical and hydraulic skills that enable them to perform multiple functions such as production planning, multi-machine minding, quality inspection and repair and maintenance.

EC studies of specific sectors (for example textiles and electronics) have illustrated the need for higher level skills.

Recent EC studies of technologies and sectors have provided the following evidence:

Textiles

High increases in productivity occurred over the last decade as a result of more capital intensive production and automation. Employment has fallen significantly. There has been a growing trend towards a decrease in the proportion of unskilled workers, increases in multifunctional skilled workers and technicians, and managers and engineers. In general, skills trends included multi-skilling, more horizontal, generic skills, more higher level skills, and greater competence amongst managers.

Electronics

The European electronics components, consumer and defense electronics industry has expanded in the past although world market share has fallen. Employment has decreased and general skills trends have been towards upgrading, with a need for multi-skilling of workers to work with flexible production systems, and for team-working requiring social skills.

Effects of a Pervasive Technology Information and Communication Technologies (ICT)

New technologies are having the greatest impact on skill requirements. Information Technologies are revolutionising the way we think about jobs and skills.

The introduction of new ICT-based equipment throughout all EC industries is resulting in increasing needs for "hybrid" managers who understand ICT applications and who are also well educated and experienced administrators and planners. At craft and technician levels there is need for multi-skilled people with new multidisciplinary diagnostic maintenance skills. In manufacturing, the trend towards multiskilling is related to the trend towards mechatronics systems which incorporate both mechanical and electronic elements.

IT Skills

Studies in Europe, Japan and the US have examined the skills-impact of Information Technologies in terms of the effects on jobs and working practices. These studies found that IT is:

- yielding for reaching implications for the design of jobs, for patterns of work organisation and for education and training systems;
- eliminating unskilled jobs, through automation;
- upskilling many jobs through work redesign such that individuals can perform multiple functions under one job, in factories as well as offices;
- upskilling the work of design and marketing specialists by directly improving features of products and services;
- creating knowhow-based occupations: programmers, analysts and knowledge engineers;
- increasing the need, in many jobs, to use self-initiative and to take responsibility, as a result of decentralisation within organisations, thereby raising the "thinking" component of work; and
- demanding more general social skills such as communication skills, team working and diagnostic skills.

5.3. The new core skills

We need to think again about the basic skills which are needed. IT and social skills are now basic "core" skills.

IT skills are part of the group of core skills which are required as a basis for participation in the world of work. Another element, which is widely recognised as a vital one, is that of social skills: for example, communications and skills in team-work (see boxes).

Core Skills

The notion of a "trade" or specialisation is getting weaker. A trend is developing towards core knowledge and skills which are used widely and which are acquired through vocational education and training. Core skills can be classified as follows:

Social Skills

Social skills include motivation and professionalism, an ability to communicate and work in teams, a sense of responsibility, and awareness. We could add skills of method such as a capacity to manage in changing working conditions, detect and cope with interruptions to the production process, monitor the quality and output of work, and apply diagnostic skills and problem - solving techniques.

Technical Skills, Including IT Skills

These core skills comprise skills such as data processing, knowledge of equipment, understanding and use of process control technology, as well as mathematics and geometry.

For example, the EC skills needs study in Dublin notes that workers attending equipment suppliers' courses do not have the basic educational background which will permit them to understand much of the course. Firstly, the technologies are based on areas of science not likely to have been covered by more mature workers' initial education and training. Secondly, quite often a group of technologies are being integrated in the equipment and again it is unlikely that workers would have the spread of knowledge to accommodate understanding of the functioning of the device.

6. Future Skills Requirements

6.1. General European Trends

The key factors influencing future skills requirements in the European Community are further globalisation of trade (especially through European economic integration); a continuing shift to service sector employment; and the impact of new technologies and changing work organisation.

Europe can be optimistic about the prospects for economic growth and employment.

Good potential prospects exist for economic growth and more employment in the 1990's provided Europe responds to the challenges ahead. However, to respond to these opportunities, European enterprises will need to develop a capacity to work within a new business environment.

This environment will be characterised by the opening up of sectors to more competition, increased capital and labour mobility, and possibilities for new regional patterns of development.

Industry is rapidly devising strategies to raise efficiency and improve its competitiveness.

Many strategies are being followed by industry in order to raise efficiency and competitiveness. These include product differentiation, development of specialised small and medium-sized enterprises, and collaborative partnerships ranging from technological agreements with foreign firms to regional associations which liaise with training institutions.

6.2. Management of change

But, the necessary actions require significant changes, particularly in skills and industrial participation, so as to manage the change process.

Within enterprises, skill enhancement and industrial participation are key approaches to the management of change needed to position enterprises for the challenges of the 1990's. To realise these competitive strategies, the broad skills required fall into three groups:

Managerial skills: namely, market orientation, persuasion and communication, teamwork, organisational awareness, cultural sensitivity and orientation towards results and performance;

Skills for the management of change

Structural, technological, and organisational change in European enterprises puts managers' skills under pressure. Key skills needs include:

- marketing skills (inside and outside their organisations)
- communications skills and persuasiveness
- cultural sensitivity
- ability to recognise and achieve results

Most of all, managers will need to create learning organisations. Managers need skills to enable workforces to learn problem solving techniques and the ability to monitor progress. Total Quality Management techniques are being used to make learning a systematic activity in organisations.

- Inter-personal and communication skills that are consistent with business operations in diverse settings. These include linguistic abilities and the ability to communicate informally in a social setting; and
- Hybrid skills: arising from varied work experience, job rotation and lateral career moves. Employees will need to acquire experience which enables them to create greater synergy, leverage, communication and networking.

Skills will be needed to enable organisations in the private sector and in the public sector to become "learning organisations".

Above all, in the 1990's, a period of great change and turbulence, enterprises will need to become learning organisations in which the workforce can continuously create new problem-solving and innovation techniques. Learning skills will be a vital ingredient in European enterprises. This is particularly true of small and medium-sized enterprises which form the majority of Europe's businesses and for which successful learning, and corporate growth and survival go hand-in-hand.

Quality Management

The South Glamorgan EC study notes that Welsh firms seeking to subcontract to the aerospace industry have to meet not only legal requirements but are also met by Vendor Appraisal Requirements entailing a five-year history of the firm and its finances, along with an assessment of its management and organisation.

And learning techniques are becoming widely available: Total Quality Management is one of those, which stresses "customers first"...

One route towards building the learning organisation is through Total Quality Management. This is a comprehensive business strategy aimed at improving business effectiveness with a strong focus on customers. It recognises that customers' requirements are multi-dimensional and that quality is a dynamic

process towards satisfying them.

...and involves the whole team in meeting customers' needs.

Team-working skills and greater responsibilities for the individual worker are consequences of TQM. An emphasis on creativity and continuing improvement will require the development of a new education and training culture, represented by the learning enterprise.

The changing role of training in firms: the learning enterprise

Today's challenge is to match training with the different needs of recipients of training. Training is now part of the whole organisation and is an efficient tool for all members of the firm. The evaluation of learning methods allows trainers to produce the required training performance. However training is still seen as the means for development of specific skills and abilities of employees. When Japan achieved prominence in the world markets, it became more widely understood that employees should be trained more widely in trouble shooting and problem solving, that employees should understand what they are doing, be analytical, be innovative, undertake change, and keep pace with advances in theory and technology. So learning how to learn became a priority. This implied a clear recognition of training as a long term investment. Indeed a factor explaining high performance in industry is the ability of the workforce to learn and to achieve sustained improvement in performance.

To develop this capacity, training must have a broader role within the firm: to enable work to be carried out using diagnostic judgement and decision making skills i.e. the ability to solve problems.

There is a clear relationship between the ability to link job performance to learning outcomes, and a reduction in the life cycle of any new product or technology strategy.

Training specialists have a new significance: they will need to enter the core of the organisation and act as well rounded business consultants who can link training and business strategies, including technology transfer and innovation.

In a changing and competitive environment, firms not only need to come up with innovative ideas but also need to regard people as the principle asset of the enterprise. The knowledge held by the individual employee needs to be shared throughout the firm (so that it is not lost if the person leaves). Perhaps this is where life long employment practices have an advantage for example practices found in some Japanese companies or in some University traditions) in providing fertile conditions for learning.

The lack of such an environment can create obstacles for efficient continuing training in European enterprises.

The challenge of training in the 1990's will be to provide workers with a new neutral flexibility in order to create and use opportunities to exploit new technologies.

6.3. Occupational Forecasts

A number of studies have forecast the future structure of employment as a result of structural change.

As a reflection of the trends in the 1990's towards enhancement of skills, further restructuring of the working population in favour of higher level occupations can be expected. Forecasts of future occupational change bear this out.

These forecasts all tell a similar story:

In the UK, forecasts by the Institute for Employment Research state that, by the year 2000, increases in managers and administrators, professional

occupations, personal services and sales occupations can be expected. Reductions in employment can be expected amongst craft occupations, operatives and some other less-skilled occupations. Translated into the demand for qualifications, there is an expectation of an increase in qualified workers, especially at first degree level; and a decline in employment of people without higher or intermediate qualifications .

Studies from BIPE in France predict that i) the share of highly skilled - "cadres et professions intellectuelles supérieures" - in the French workforce will increase from 9.9 per cent to 10.1 per cent over the period 1989-95; ii) the share of professionals will grow from 1.3 per cent to 1.7 per cent over the same period; iii) most new jobs will be created in executive, technician and skilled manual work occupations.

Trends in the Employment Structure, Textiles Industry 1900-1995

	Unskilled operators	Skilled operators	Technicians and foremen	Administrative personnel	Engineers and managers
D (West)	---	---	+	-	++
B	---	--	++	--	+
DK	--	--	+	0	+
E	---	--	+++	-	++
F	---	--	++	--	+++
GR	--	--	++	0	++
IRL	--	-	+	-	+++
NL	--	--	0	0	+
P	---	-	++	--	+++
UK	---	--	0	--	+
EC	---	--	+	-	++

0 Minor changes +/-5%

--/+++ Decrease or increase between 10 and 20%

-/+ Decrease or increase between 5 and 100%

---/+++ Decrease or increase or more than 20%

Source: Observatoire Européen des Systèmes de Formation et de Transfert de Technologie dans l'Industrie Textile, 1991.

Changes in manufacturing industry demand for labour by activity and Member State 1988 and 2000

	Unskilled labour	Skilled labour	Supervisors and middle managers	Highly qualified labour	Employment
Belgium	-	0	++	+++	0
Denmark	-	+	+	+++	+
Federal Republic of Germany	-	0	+	+++	0
Greece	-	++	+	+++	+
Spain	-	++	+	+++	+
France	-	0	++	+++	+
Ireland	-	0	+	+++	0
Italy	-	+	++	+++	+
Luxembourg	-	0	++	+++	+
Netherlands	-	0	++	+++	+
Portugal	-	++	0	+++	+
United Kingdom	-	0	++	+++	+
Total EC	-	+	++	+++	+

---/+++ Decrease or increase of more than 30%

-/+ Decrease or increase between 5% and 15%

--/+++ Decrease or increase between 15 and 30%

0 Minor changes +/-5%

Source: BMWI 1991

The German IAB Prognos study forecasts an increase in Germany of 3.4 million jobs in the highly skilled occupations and a decrease of 2 million jobs in basic level occupations between 1985 and 2010.

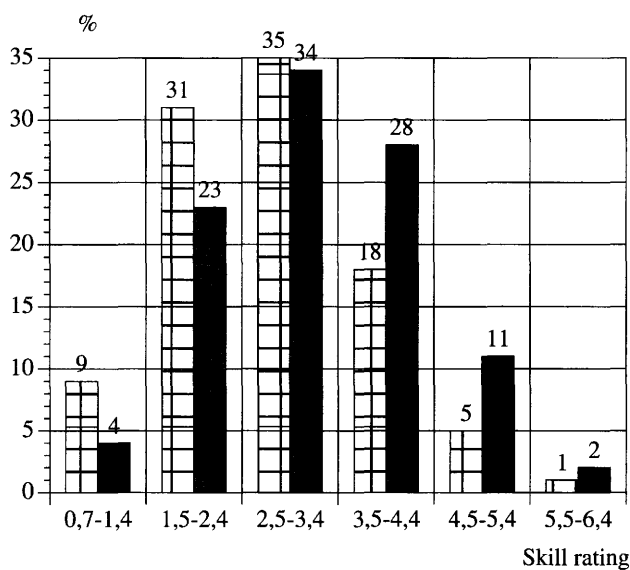
Occupations which involve leadership tasks and qualified skilled workers are marked out for growth. This will mean even greater demand for university and higher education graduates, and for people who have completed company apprenticeship training.

A similar scenario has also been identified in southern EC Member States. Portuguese research for example, forecasts a marked shift towards secondary and postsecondary school qualifications to be held by the

workforce over the period 1981-2001. The shift reflects two factors: low participation rates in the secondary and post-secondary sectors in the past, and the expectation of a big catching-up process in the 1990's; and rising skills-intensity of work.

Work predicting skill requirements has also been carried out in the USA by the Hudson Institute. The results show that the skills rating of new jobs is unmistakably higher than those of existing jobs. This trend towards higher skills-intensity is likely to continue over the period until the year 2000, according to the study.

The Changing Structure of Skills in the Workforce

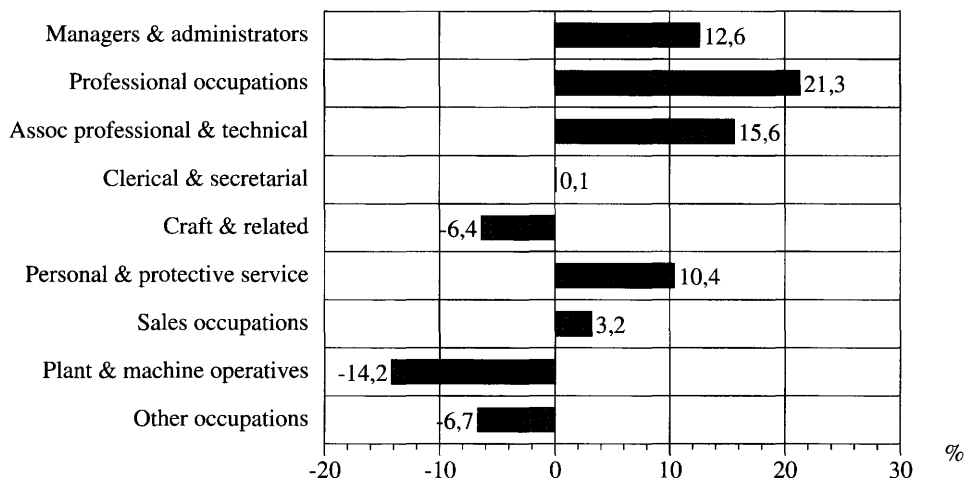


Representative Jobs

Natural Scientists	5,7
Lawyers	5,2
Engineers	5,1
Management	4,4
Teachers	4,2
Technicians	4,1
Marketing & Sales	3,4
Constructions	3,2
Administration	2,9
Service Occupations	2,6
Precision Production	2,5
Farmers	2,3
Transport Workers	2,2
Machine Setters	1,8
Hand Workers	1,7
Helpers & Labourers	1,3

Source: "Workforce 2000" (Hudson Institute, 1987)

Changes in Occupational Employment, UK forecast 1990-2000



Source: Institute for Employment Research, 1990

6.4. Trends in Specific Sectors

The European Commission has also supported studies which have looked across European industry and technology sectors at what is likely to happen to skill requirements.

Recent European Commission studies of sectoral skill requirements provide the following indications of future skills needs:

In the electronics sector (consumer and defence electronics, and components), a recomposition of a numerically stable workforce is expected. Unskilled workers could decline in numbers by more than 30%, and substantial increases are foreseen for numbers of technicians and managers. More emphasis is likely on developing commercial expertise and customer service skills, software skills (especially at technician and engineer level) and production monitoring skills.

In the textiles sector study, employment is forecast to fall in the 1990's by perhaps a third, depending on assumptions used. The workforce is expected in future to consist of growing numbers of multi-functional skilled workers and technicians, more managers, and more engineers. Changes in the balance of skills are expected. For managers this means a new emphasis on acquiring knowledge of computerised textile equipment, an ability to motivate and use other methods to improve the quality of production, and the development of coaching skills. On the shop floor, the majority of workers will need to enhance their skills, especially in understanding and using computer controlled equipment, data interpretation, and making rapid adjustments to production in response to customer demand.

Key trends in tourism include a growth in holidays with high environmental quality, for example in seaside resorts with clean beaches or holidays linked to culture and heritage. The quality of services provided to customers is becoming a central consideration. Future skills needs in the tourism industry are likely to include more management skills especially in personnel management and in internal and external company communications, foreign languages, and business hybrid skills for example bringing together marketing, sales techniques and computerisation.

The retail sector is increasing in importance in Europe, in terms of the number of jobs and contribution to GDP. Part-time work is a particular feature of the retail industry, and appears to be slowly increasing; part-time work and female employment are closely linked. Factors which are influencing skill needs include

technological change, changing management structures and increased use of customer service as a competitive weapon. The number of managers and supervisors is rising relative to the number of workers. This is due to a number of factors: technological change gives more emphasis to the need to analyse data, a more decentralised managerial structure, and the drive for increasing levels of customer service. For retail workers, the introduction of new technology has led to a de-skilling of some of the job roles eg through scanning equipment. This may lead to a greater emphasis on the qualitative aspects of jobs, such as customer quality.

For the construction industry, a recent UK study ("Future Skill Needs of the Construction Industries" by IPRA) suggests that defects in modern buildings are forcing a fresh appraisal of construction skills and training needs. All workers will need to possess a broad understanding of methods used in modern construction work, how Information Technology can be used effectively, and how to protect the environment. Increased use of pre-fabrication techniques means that construction managers increasingly need skills to coordinate on-site and off-site operations. Construction teachers will need to be able to teach the new technologies and interdisciplinary skills.

6.5. Pervasive Technologies and New Skills Requirements

Of great significance in influencing future skill needs will be the effect of new technologies, particularly if they become as pervasive as ICT.

Information technology, biotechnology and new materials call not only for new technical skills but also new hybrid skills, for example, for scientists with project management skills and managers with information technology and marketing skills. Hybrid skills are needed to ensure the effective diffusion and application of new technologies, and development of new products and processes. Skills in management of environmental quality will increasingly be interdisciplinary, permeating a wide range of activities.

Information and Communication Technologies

The IFO/MERIT studies of information and communication technologies for the EC showed that the successful application and diffusion of ICT depends upon levels of investment in the telecommunications infrastructure, in human resources and in the management of change - social and technical - within enterprises and organisations.

As a consequence there is expected to be a continuation of the growth in those occupations and skills, such as software skills and business skills, which are crucial to support the analysis and development of new product strategies and production methods.

Biotechnology

New biotechnology processes involving genetic manipulation are expected to revolutionise sectors like agriculture, chemicals, food and drink, and process plant.

During the next ten years, the increase in EC employment resulting from biotechnology will probably be small and concentrated on R & D. An OECD report ("Advanced Materials; Policies and Challenges", 1990) has suggested, however, that by the next century, biotechnology will begin to acquire an importance of the same order as Information Technology now. Skill requirements will shift to more graduates and technicians, involved in designing and operating processes such as enzyme technology, protein chemistry and biochemical engineering. There will be needs for hybrid skills - scientists involved in project management will also need management and business administration skills.

New Materials

The effects of new materials are likely to permeate

significant parts of the global economy. Not only is production of the materials themselves growing, so too are new "applications" industries, such as the production of ceramics manufacturing equipment. The effective use of new materials demands major changes in manufacturing processes and significant retraining of the workforce.

New skills in management, design, inspection and maintenance will be needed, and these often involve new combinations of skill. There is need for managers and engineers - whether design or production engineers - to consider the whole process of design and manufacture as an integrated system.

6.6. Environmental Skills

The EC study of skills needs linked to the Environment points to the diffusion of environmental considerations across a very wide range of economic activities. This will bring about great changes in products and production processes. Environmental skills will become generic skills, just like IT skills, and will be required across a range of occupations and skills levels. The relationships between products, production methods, and the social and ecological infrastructure at all levels - local, regional and global will need to be understood. For example, management training will combine business administration with technological and environmental awareness.

7 Labour Market Problems and skills shortages

High unemployment coexisting with skill shortages is threatening Europe's ability to compete.

After a decline during the second half of the 1980's, the rate of unemployment began to rise again in 1990 and is still rising in the EC. Despite this increase there is evidence that European enterprises are facing shortages of the types of skilled labour they require to function properly and therefore to compete in European and global markets.

For example, the Hainaut-Namur (Belgium) EC study report poses the basic problem: "why, in spite of the numerous professional and technical schools is there a coexistence of a high unemployment rate and unsatisfied job offers?".

Current skills and qualifications are inadequate.

European labour markets today are, for a good part, characterised by structural problems arising from a lack of skills, qualifications and effectiveness of human resources. It is necessary to focus on the causes of this qualitative as well as quantitative mismatch in the labour market.

We know this from several indicators.

In order to identify the existence of skills shortages it is necessary to develop and use a variety of indicators. One indicator relates to recruitment difficulties, although these difficulties may not reflect the true skills shortages which enterprises are facing in their day-to-day operations. Studies of specific sectors, technologies and regions have also yielded information about current skill needs and shortages.

7.1. Recruitment difficulties

The European Commission services have devised an indicator of labour shortages based on results from quarterly business surveys, which include questions about recruitment difficulties. These surveys examine the extent to which output is constrained by a lack of production capacity and by other factors, including difficulties in recruiting labour with the right skills. The results (discussed for example in "Employment in Europe 1991") suggest that between 1982 and 1990 recruitment difficulties increased throughout the Community, although this was not the case for Denmark and Ireland. For Spain and Portugal data were available only recently. However, a survey in Spain showed significant shortages in areas such as welding, graphic arts, automation, and hotels and tourism.

Recruitment difficulties, in most countries, were associated with an increase in capacity utilisation, and with tighter labour markets (lower unemployment), from the mid 1980's. As to be expected, this problem eases with recession.

It should, of course, be kept in mind that skill shortages linked to recruitment difficulties represent only the tip of the iceberg which constitutes overall skill shortages of the employed workforce.

7.2. EC Work on Skill Shortages

EC regional studies of skills needs show for example that managerial skills are in shortage throughout the EC.

Management skills were found to be in shortage throughout the regions studied. Smaller firms were faced with especially severe problems. In these firms, executives were typically not highly qualified themselves and therefore a training culture was not well established. However, even in small firms, executives were faced with a highly complex business environment. Their customers required products delivered to sophisticated and flexible specifications.

To respond, firms would need to develop decentralised organisations and management structures.

Management Shortages

To take just one of many examples from the EC regional studies, in Western Greece severe skills shortages were reported for middle-level managerial personnel. Shortages in managerial staff were explained by the small size of the local labour supply. Firms located in areas which are far from the city of Patras cannot compete with firms located in Patras, still less with firms in Athens, as far as their ability to attract qualified managerial staff was concerned.

Social skills are often forgotten, but are important for industry.

There was a need for a greater capacity for greater autonomy, polyvalent skills, initiative, adaptation, mobility and communication. These could be termed the social, behavioural or organisational skills. Social skills were found to be of particular concern to advanced companies. These skills include the ability to communicate, to be reliable, to learn, and to convert

technology into commercial opportunities in changing and competitive markets. The increasing recognition by firms of their social skills requirements was observed, particularly in the more developed regions. A close link was found between social and organisational skills and the move to new methods of organisation.

N. Jutland Social Skills

The North Jutland (Denmark) EC regional skills needs study showed that firms are placing a major emphasis on individual initiative, readiness to learn and willingness to adapt to change. To describe their human resource needs, firms used terms such as: "deep technological insight, flexibility, ability to adjust, quality consciousness, and ability to coordinate and plan". The North Jutland Study report interpreted this as indicative of firms' need for an extensive improvement in general qualifications, especially amongst unskilled workers.

Across all regions there were shortages of "process independent" skills: i.e. skills which are common to many processes and which include the ability to plan production, understand general concepts of quality, IT skills, and languages. The benefits of these skills include the flexibility and transferability of workers.

Technical skills needed to use new technologies are in short supply.

Technicians and Technical Skills Shortages

In the Weser Ems (Germany) EC regional study, for example, 45 % of responding enterprises assessed as severe their shortages of skills required as a consequence of the installation of new equipment, technology and systems. In the Pays de la Loire (France) study, 70% of firms responding said they had problems finding the skilled staff they need. A lack of qualifications could be observed at all levels of employment, the need for technicians being the greatest.

Information Technology skills and other generic skills like environmental skills are at a premium.

One report referred to requirements across several regions for specialist Information Technology skills in many and diverse industries including banking, retailing, mechanical engineering, clothing and textiles. Similarly, there was a lack of technical skills needed to monitor and enforce environmental

regulations; as well as a need for the commercial skills to respond to the public's concern for environmental safety and quality in products and processes.

Benefits would be derived from a transfer of skills and know-how between the more advanced and the less developed regions and enterprises

Associated needs for skills in industrial best practice were of major concern to firms in the less-developed regions. In the study of the Palermo region, the Training Boards indicated a need for new kinds of services like briefing by experts and industrial placements in advanced firms.

7.3. EC Sectoral and Technology Studies

The European Community has examined skill shortages in relation to the need to improve research and development, and technical skills and competence.

The IRDAC Report

The Industrial Research and Development Advisory Committee of the European Commission (IRDAC) became concerned that higher investment in technological research and development might be ineffective due to a lack of qualified people to research, develop and exploit advanced and innovative products and processes.

The IRDAC report on skill shortages in Europe noted that shortages of scientists, engineers, technologists and technicians were apparent in the key generic technologies: electronics and TT, Systems Engineering, Telecommunications, Biotechnology and Advanced Materials. The transfer and diffusion of these technologies into all sectors of the economy will require more skilled manpower, including people with new and multi-disciplinary skills.

The IRDAC report said that:

- for basic IT skills: the education systems do not equip young people with these skills; the continuing education system needs to give major attention to equipping the existing workforce with basic and advanced IT skills.
- for advanced IT skills: significant shortages of advanced IT specialists were noted, including VLSI designers, software designers, and data communication specialists.
- in other IT occupations: shortages have occurred in the

Supply and Demand in the Labour Market for Engineers, 1990

	Newly qualified engineers	Demand for engineers	Net difference
Germany	31.000	31.000	0
United Kingdom	18.000	26.000	-8.000
France	14.000	25.000	-11.000
Italy	8.500	23.000	-14.500
Spain	8.700	14.000	-5.300
Netherlands	11.200	9.000	+2.200
Belgium	4.700	8.700	-4.000
Denmark	4.000	3.200	+800
Portugal	2.000	3.500	-1.500

Source: ERA, Skill Needs in the EC Electronics Industry, 1991. The electronics study report states that the situation in the labour market for all engineers is fully reflected in the electronics industry.

“new” occupations creating IT networks, such as Systems Analysis.

skills are needed for the effective diffusion of IT applications in all sectors of the economy, including skills amongst shopfloor workers in the use of modern process control equipment.

EC sector studies in the last year have confirmed this IRDAC work.

In electronics, for example, shortages of engineers and technicians have been observed in most Member States. Some Member States have also experienced management skills shortages.

Skill shortages will slow down the diffusion of new technologies and their use in a wide range of industries.

EC Biotechnology companies were found to have a shortage of personnel, including technicians, in bioprocess engineering. This results from the shift of emphasis in Biotechnology from research and development towards commercial applications and production. There is also a need for better management skills (laboratory and project management, and business and personnel management) and training in matters related to intellectual property rights and project risk-assessment techniques.

A special concern is to have wider training and public information about the nature and potential of Biotechnology to help overcome prejudice and stimulate the technology’s market-led development.

The IFO and MERIT programme of studies for the EC on the impact of information and communication

technologies on employment noted that skills which facilitate applications and diffusion of IT in new products and processes are in short supply. In particular, software skills shortages remain a real problem and are expected to persist for a long time to come. Shortages of software personnel reflect the need for skills in recognising opportunities, designing and experimenting with ways to respond to opportunities, and implementing the changes needed in the workplace.

7.4. Pressure on Europe’s human resources

Europe’s human resources are underpressure they need to be developed.

Pressures on Europe’s human resources stem from demographic change which is reducing the number of young people available for training and the labour market, and from skill shortages which arise from inadequate development of human resources.

7.4.1. Skills and demographic change

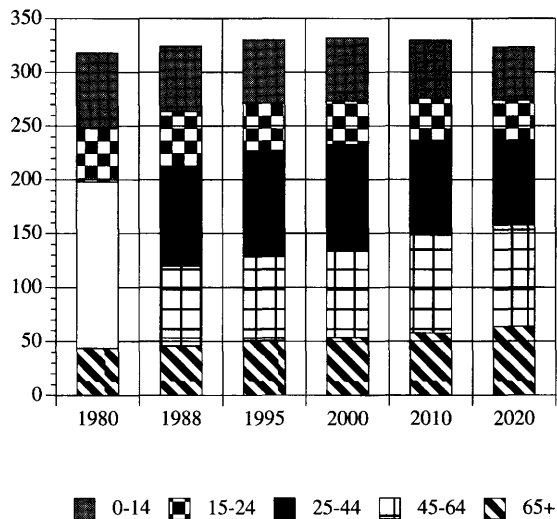
Demographic changes pose a problem...

The ability of European enterprises to meet their growing and changing demands for skills may be jeopardised by an additional pressure on human resources: change in the demographic structure of the working population.

Recent work by EUROSTAT forecasts that the age

Demographic development in EUR-12

Population in millions



Source: Eurostat (excl. former GDR)

group 40-59 will increase from 44% to about 54% of the 20-59 group by 2015. So in the 1990's Europe can expect that:

...because of fewer young people...

The Community will have fewer new entrants to the labour market; and there will be fewer younger students enrolling for higher educational qualifications, if participation rates do not rise substantially.

...and the ageing of the workforce.

There will be more older workers. A majority of these workers will have had no more than basic schooling in their early formative years. Analyses of the effects of the ageing of the labour force have concluded that much more continuing training will be required to maintain the flexibility and adaptability of the Labour Force.

The effects of demographic change will also affect the pattern of demand for services and hence skills.

Demographic change will affect the pattern of demand for goods and services. A further shift towards service sector employment is likely, reflecting the growth in demand for health and social services, and tourism and leisure services. We can expect a greater need for skills in personal care, communications, and in quality assurance methods to meet the requirements of more sophisticated consumers.

The skills available to European enterprises and organisations will be put under pressure as a result of

demographic change. Strategies for effective and efficient development of all human resources are therefore required.

7.4.2. Skill shortages

Skill shortages reflect the ineffective development of Europe's human resources.

Skill shortages indicate there is an under-development of Europe's human resources. In assessing how better to supply the skill needs of the 1990's it is necessary to understand the causes of skills shortages. The EC skills shortage studies revealed causes relating to problems of skills supply, skills demand and the "interface" between the two.

The causes of skill shortages are complex.

On the supply side:

Skill shortages were attributed to declining numbers of young people; lack of labour mobility; outward migration from less developed to more developed regions; poor transport and education and training infrastructure; many unskilled long-term unemployed; the poor literacy, numeracy and work ethic of job applicants; and, of course, the inadequate and outdated skills of the existing workforce.

Training Supply

In Palermo (Italy), the content of courses was seen as determined by the expertise of the trainer and essentially traditional and out-of-date. Ireland has similar difficulties in providing appropriate training, while training costs per trainee are among the highest in Europe. Difficulties of obtaining training were found outside large cities in the reports of Central Portugal, away from the coastal towns, and Ireland, outside Dublin and Cork.

Many regions report major difficulties in the supply of trainers at all levels. Central Portugal sees it as the core difficulty faced by the region: "Shortages of qualified trainers is considered, therefore, as the main cause of the regional lack of quality training. It affects mainly the inland located firms (ie firms remote from the main regional industrial concentrations) and small and medium-sized enterprises". Equally as bad, the involvement of non-qualified instructors to fulfil training contracts has been to lead to a discrediting of training activities, which were hastily and dangerously viewed (by trainees as well) as a business, instead of being assumed as an important investment at all levels. The Thames Valley (UK) report has drawn special attention to the lack of business knowledge held by training providers and school teachers.

On the demand side:

Skill shortages often could be attributed to the unclear formulation and communication of firms' skills and training requirements. The poor image of some sectors resulted in a difficulty in attracting bright recruits. Inadequate policies for human resource development and labour retention, reliance on poaching instead of training and a failure to communicate skill needs to training providers were common, particularly in small firms.

Image Problems

For two English regions (Thames Valley and Anglia), the problem in 1990 focused on getting people to work in manufacturing industry and the relation of schools to manufacturing. The East Anglia EC study noted, "While a limited number of firms conducted programmes with local schools, including company visits and liaison with teaching staff, it was felt that in most schools the teaching staff had little knowledge of industrial practices and opportunities. Therefore they were unlikely to display suitable enthusiasm for a career in industry for their pupils. The poor standard of many early school leavers in the basics of education was cited by many employers". Thames Valley employers reinforced this point emphasising "the inadequacy of the pupil leavers' basic skills, and their lack of positive work ethic".

The key to alleviating skill shortages is a better interface between those who need skilled people and the training providers.

"Interface" problems:

As mentioned in Part A, good training interfaces are part of the pattern of networks contributing to regional development. In the EC regional studies, the failure by firms effectively to communicate skill requirements and the inability of training providers to be responsive and economical in providing training was found to lie at the heart of problems associated with the poor link or "interface" between the demand for skills and the supply. Governments were seen as needing to play a more constructive role, including support for the development of new qualifications for new types of jobs. Also, it was thought there was a role for Government to help firms to begin to see training as not just a cost but an investment.

Unless the interface is improved, skill shortages will continue to impose a real cost on the European industry and economy.

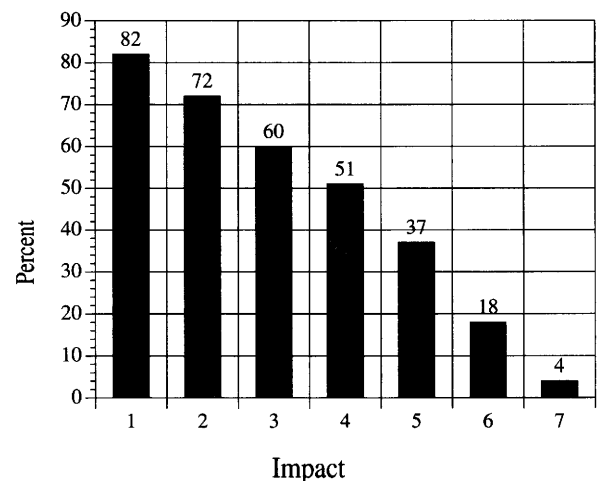
Training as an investment

The Pays de la Loire (France) report notes, "firms still see training as a cost, not as an investment. This can clearly be seen by the fact that 54% of the surveyed firms state that they don't have the funds. A quarter of the firms admit that their training policies are not sufficiently developed. The blame for this must be shared by the staff too: 27% of firms explain that unmotivated staff have prevented them from achieving their strategies, 24% of those facing difficulties over Internal recruitment say that it is due to lack of motivation in the staff...".

The cost of skill shortages

Given the need to respond positively to a rising level of international competition, technological change and structural change, skill shortages will need to be tackled or their damage to the competitiveness and productivity of enterprises will increase. In a period when human potential to manage and adapt to change will provide the key to the quality of life and social cohesion, skill shortages represent an increasing cost to society. As the IRDAC report has warned: "Skills shortages are such a threat to Europe's competitive position that immediate action is required from all parties concerned".

Impact of recruitment difficulties



1. More strain on management or existing staff in covering the shortage.
2. Extra pressure on management in seeking recruits.
3. Increased running costs.
4. Above average recruitment costs.
5. Severe restrictions to business development activities.
6. Loss of business to competitors.
7. Other.

Source: Skill Needs in Britain 1990

The SME skills trap

The bulk of Europe's enterprises - its small and medium-sized firms - are facing particular difficulties

The skills demand-supply “interface” was shown by the EC skills needs studies to be of great importance in explaining enterprises’ human resource development problems. This was particularly so in the case of small and medium-sized enterprises (SME’s). For example, the study from Pays de la Loire noted:

“SMEs have particular problems with training: of course lack of funds, of time and of human resource planning; but also the specific problem of not being able to quantify their needs in the area of skills. They are hardly able to predict their short term future, and still less the extra qualified staff they need at the moment; don’t talk of human resource planning... If the firms do not come forward, then trainers cannot be expected to respond to their demands or expectations.”

Women and Skills Shortages

Women could make an enormous contribution to the modernisation of industries and to Europe’s prosperity.

Demographic change has important implications for women’s employment and training in the 1990’s. As one response to the falling numbers of young people and the “ageing” of the workforce it will be necessary to draw more women into the labour market. Already, by the end of the 1980’s, about half of students in higher education in Belgium, Denmark, France and Italy were women, whereas today women still occupy a minority of managerial and supervisory jobs. This contrast together with a trend toward more flexibility in working organisation and working time can only result in a further rise in female employment in the 1990’s. The way to improve competitiveness and productivity is to enable women to contribute their skills to enterprises. Information Technology, management and the scientific and technical professions are areas where skills shortages are increasingly serious but where increased female representation would bring great benefits.

Women face difficulties not only in returning to employment, but also once in employment can face a “glass ceiling” which prevents their rise through occupations and organisations - a barrier stemming from, amongst other factors, discrimination in recruitment practices, lack of opportunities to participate in career development activities including training, and insufficient recognition of the contribution which women can make to productive enterprises.

Women and IT Skills

Information Technology as a universal technology is creating opportunities to re-shape work organisation and raise the quality of jobs. The new jobs evolving as a result of Information Technologies provide opportunities to break the "glass ceiling" - the segregation in women's employment and the disadvantages arising from career breaks. The new IT-based jobs could be seen as an example of a "clean slaten, suitable for both men and women and free from old-fashioned recruitment and training practices; and there is less need for brawn and more for brain, and jobs are cleaner. Manufacturing work is more and more characterised by the management and control of technologies which in turn operate the physical processes of production.

Despite this, we find that even in IT-based jobs women are poorly represented and tend to work mainly at lower levels like data input and electronics assembly operations. New patterns of segregation are setting in, even in the new technologies: computing attracted large numbers of women in the early days but these occupations have become more "de-feminised". In the UK for example, the number of women on computer courses at universities has been declining.

A study for the European Commission Task Force Human Resources by Teresa Rees of Cardiff University has examined the skills and training needs of women for the new Information Technologies. Training for IT increasingly requires general skills such as communication skills, proficiency in foreign languages, an ability to work in teams, diagnostic skills and willingness to take responsibility.

Many of these skills, such as communications, are often regarded as skills in which women excel. Indeed, communications may prove to be the key social skill needed in the successful application of new technologies.

For example, in the work of the business analyst, an ability to deal effectively with other people and communication skills are especially valuable. The technological aspects of business analysis takes up a small part of the time. Skill Shortages are found all over the European Community in this important work, which is vital for the wide diffusion and application of new technology in industry.

Widening recruitment for this skill shortage area could allow more people to contribute to economic growth. New sources of skills

could be non-technical graduates and existing employees, for example in secretarial and clerical grades. Secretaries are often overlooked, but there is evidence that those who can use a full wordprocessing package could see taking charge of a business computing department as a career goal. Such clear career routes for secretaries within organisations are not common. This is because, for example, the perceptions held by managers of the potential of secretaries has not changed in line with secretaries' actual skills and training. Business managers may not fully understand the scope of the new technologies and the job redesign opportunities which can be created from them.

In order to improve prospects for women, several complementary approaches are possible:

- The introduction or upgrading of IT should involve job redesign, in order to give women an opportunity to contribute more through their skills.
- Business Managers can be trained to understand the implications of new technology for job redesign and in equal opportunity thinking.
- Recruitment policies can be developed to help and encourage women to work their way up the organisation.
- Training for women returners should open up access to information and to networks, leading to better chances of getting jobs.
- Women-only training could be considered, for example as a way of fostering female networks.
- Action can be taken at an early stage, for example by the use of computers across a wider range of school curricula.

Training systems and employers are not geared to the needs and potential of women. The capacity to fill skill shortages in new technologies is impaired by this, even though women are ideally suited to provide these skills. There is a need to design comprehensive policies to enable women to meet skill shortages arising from new technology developments as well as to enhance the overall labour supply in the current period of demographic change.

8. Outlook

All in all, we should recognise the shift to higher level occupations and higher level skills. We should recognise the key importance of better social skills and competence in the use of new technologies.

Taken together, the research on past skills trends, future skills needs and skills shortages in Europe indicates:

- The occupational structure of the workforce in most Member States is changing in favour of skills-intensive occupations and against low-skills occupations.
- Within occupations there is a widening of the skills needed resulting in multi-skilling; and a trend towards higher-order thinking and systematic learning skills namely, the ability to analyse, synthesise and solve problems in the workplace.
- Generic, cross-sectoral and social skills are increasingly recognised as vital to cope with change, to apply new technologies and respond to competition. In so far, this need corresponds to the one for a human and democratic European society.

Skill shortages are widespread and have got worse.

However, evidence exists that there are widespread skills shortages already across the European Community. Given all the factors which, in the 1990's, will come together to increase competition and put pressure on resources, there appears to be a serious risk that skills shortages could intensify across the European Community and their effects could grow in significance.

Solving the mismatches:

The Europe of the 1990's will be one of rapid change. A more skilled population will be needed and different, rapidly changing, skills and qualifications will be the order of the day. It makes no sense to try to plan a detailed response to the future. But it will be important that European industries should be clear about what their needs are (the demand side) and that (on the supply side) the education and training systems have to be faster and more flexible in response.

This is true for all economic sectors, regions and new technology areas, all of which - even during periods of high unemployment - are experiencing skill shortages. These imbalances are inherent to a dynamic economy. Moreover, one cannot add up all the skills and training needs and present the European education and training systems with a balance sheet of "needs" to which they should respond. The problem of mismatch of skills can only be dealt with in specific labour markets, sectors and regions in order to enable the two sides of the equation, demand and supply of skills, to interact fruitfully.

This leads us to the central question: What needs to be done to increase the quality of Europe's human resources in order to cope successfully with change ? What reforms in education and training systems are required in order to produce the new skills ?

Part C: Reshaping European education and training systems

Europe's education and training systems - as part of the supply side of the equation - need to be more flexible and responsive to the rapidly changing skill needs outlined in this Report. The key issues are that:

priority should be given to people, and this calls for a life-cycle framework for education and training systems so as to connect them to the real and evolving needs of individuals as their careers develop;

a broad consensus is required based on the view that education and training is an investment for which

individuals, governments and enterprises share responsibility to pay;

- there is no need to create new and additional systems of education and training, but there is a need for improved information, different means of access and new relationships and partnerships between the different sub-systems already involved;
- Europe has to find a new balance between social protection and a dynamic economy, since the obsolescence of skills is a major risk for all workers.

9. Giving Priority to People - The Life-Cycle Framework

Life-long learning is a systematic approach to enhancing and broadening access to training.

Giving priority to people means opting for the development of a certain type of European society. Given skills shortages in the labour market on the one hand, and the economic and social challenges Europe is faced with on the other, there is only one way forward: Europeans should invest in their skills and qualifications whole over the life cycle. In doing so they will achieve a balance between job security (which may mean being tied to a single enterprise) and flexibility (with possible loss of social protection).

Between the two positions there is a place for a dynamic training and qualifications market from which individuals can benefit through some minimum rights and entitlements. Giving priority to people does not imply strict individualism. As an approach it embraces concepts of solidarity and shared responsibilities, in which society should play a prominent role.

Giving priority to people also means to take as a starting point an individual's life cycle. This cycle cannot be described as a simple three-phase-model: education and initial training, work (or, in the case of many women, moving in and out of the labour force), then retirement. Over the lifetime of a single individual, their skills have to be renewed continuously to a considerable extent.

What every individual needs today is an entry qualification to get a foothold in the world of the work, followed by flexible opportunities for human resource

development acquiring a "portfolio of competences" rather than a once-and-for-all passport to a career. Such an approach also corresponds better to the needs of the economy because of the rapid structural and technological change taking place. In other words: what should be developed in practice, is a concept of life-long learning focussing on the individual's opportunities over the life-cycle. It has to be a systematic approach, in which the various components of education and training combine together in a new mix, which is sympathetic and supportive to peoples' lives.

There are at least three reasons why Europeans have to take life-long learning very seriously:

First, it implies an extension of individual freedoms and opportunities. Access to education and training throughout life means more control over time, opportunities to break out of a rigid education-work-retirement sequence, and easier reintegration into the labour market in cases of career breaks.

Second, this overall approach to education and training can help to revitalise the political objectives of full employment and social security. The current economic slow-down shows, as in past recessions, that in a world of continuing structural change it is vital that individuals do not slip into long-term unemployment and dependence on state income. Rapid and flexible access to training and retraining will help to avert this.

Third, if Europe is to master technological and

organisational change people have to frequently renew qualification and skills. Their faster obsolescence is an irreversible historical phenomenon. The initial investment in qualifications and skills no longer lasts throughout all the life-cycle. This is the inexorable economic logic which makes it necessary for individuals, enterprises and society continuously to invest in the training of the working population.

However compelling the need for a life-long approach to education and training, the problems of organising education and training as a coherent system are enormous. But we can take heart if we realise that a systematic approach does not mean a single system managed from the top. What it really means is a coherent set of opportunities for individuals, to be available flexibly at different points in the life-cycle. The framework needs to be clear so that various actors - individuals, families, enterprises and supplying institutions - may play their role, and bring their efforts and resources into the total framework. Indeed, this is the only way that the overwhelming financing problems can be solved, mobilising the contributions of all concerned.

This life-cycle framework will involve building new bridges between education and training, both in terms of content and of access in various ways. At the same

time, it will facilitate mobility both in geographical and professional terms.

Industry and life-long learning

The European Round Table (Reshaping Europe, page 19) report states: "...education in today's world is no longer solely the domain of the young. The fund of human knowledge is doubling every ten years, and both young and old people are required continually to update their knowledge base and to apply it. The business of everyday life is becoming more complex through the rapid application of new technology derived from new knowledge... Life-long learning is now a prime requirement for a full and happy life. Nowhere is this more important than at work."

The priorities for such a new successful system would include:

- . clear possibilities for the individual to progress from vocational and technical studies into higher education;
- . continuity between initial and adult training through e.g. credit transfer and accumulation;
- . greater parity of treatment between students in technical training courses and those in education or academic ones;
- . transferability of qualifications which offer the possibility of going on to a further and higher level later.

10. Shared responsibilities: An Investment Approach to Education and Training

Investment in education and training is a shared responsibility and the costs and benefits need to be identified as part of the debate about how to finance the investment.

This chapter is about two issues:

- firstly, that education and training constitutes an investment in Europe's future;
- secondly, that this investment has to be organised through shared responsibility between individuals, enterprises and society.

10.1. Education and Training: An Investment

We have seen (Chapter A.1) that a consensus has grown between politicians and economists on the key role of human resources in development. In economic terms "knowledge" and human resources are now accepted as an endogenous factor in growth theory. They contribute by raising the return of both tangible and intangible investment. There is even evidence for a virtuous circle: more investment in education and training gives rise to more knowledge, more growth and again more investment. Soskice (1991 speech in Dublin), in analysing different welfare patterns in Europe found that there is evidence for such a virtuous circle, mainly related to the systems of vocational education and their differences throughout the EC.

The Commission's Communication on Vocational Training Policies in the 1990's (1991) states in this context that one of the main objectives must be to invest in vocational training to master the challenges ahead and to achieve a reduction in regional disparities. This statement is confirmed by European Industry, acknowledging that the strategic investments needed for business to succeed in Europe include technology, physical infrastructure and the skills and competences of people (European Round Table, 1991).

A lack of investment in education and training results 1) for the individual in reduced expectations for earnings, poorer career opportunities, lower job satisfaction and a higher risk of unemployment; 2) for the enterprise in less productivity, quality and innovativeness, and thus in a weaker competitive position; and 3) for Europe in foregone welfare and

employment. As a consequence, although difficult to quantify, investment in education and training will result in positive returns.

10.2. Shared Responsibilities

Regarding education and training as an investment does not mean there should be only one investor. Instead, this investment has to be shared between the different actors: individuals, enterprises and the public sector. The specific allocation of responsibilities and the linked question "who pays?" need to be discussed in the context of each different training system. Nevertheless, the principle should be accepted.

A starting point could be to analyse "who benefits" using a broad approach and including the issue of special social responsibilities for specific groups. For example, adult continuing training requires a sharing of responsibilities between enterprises, individuals and the public sector. To state but two possibilities:

- it is the enterprise's responsibility when training is the necessary condition for using new equipment or for changes in work organisation, but the public sector could provide incentives to stimulate or support change;
- the training responsibilities lie with the public sector for specific target groups such as job seekers or the handicapped for their (re)integration into employment.

It is precisely because of the principle of shared responsibilities that the Commission favours a tripartite approach to training and qualifications as is called for by the European Social Dialogue. Furthermore, more flexible and varied life-cycle training patterns for individuals is one of the great challenges of the 1990's. At least it should be recognised that the loss of qualifications and professions is now one of the greatest risks facing people. From this point of view too, life-long investment in education and training under the principle of shared responsibilities should become a forward looking strategy.

Following the principle of subsidiarity, the European Community provides for the European dimension in education and training by organising exchanges of experiences, ideas and people, and by favouring cooperation and the cost-sharing, transnational development of innovative schemes. This approach is supported by Member States as well as the partners in the Social Dialogue.

11. A Quality Revolution in Education and Training

There is no need for new education and training systems. What is required are structures which allow for an individual's life-long learning; and make the systems more effective by ensuring transparency, access, anticipation and cooperation (see for example European Commission's Memorandum on Vocational Training Policies for the 1990's).

Looking at the problems of education and training in the life-cycle context, it is clear that rigid, formal education and training systems which separate the generations, feeding into rigid systems of qualifications which exacerbate the problem of skill obsolescence for the individual, will fail to meet the challenge of the 1990's. The mistake would be to see life-cycle education and training as a call for yet another new system.

What is needed are stronger relationships between existing structures in order to allow for a more flexible, inter-generational and responsive framework including:

- new education and training methodologies, technologies and organisational networks;
- more flexible systems of qualifications;
- anticipation of changing skill needs;
- cooperation between all actors; and
- special provisions for SMEs.

11.1. New Relationships between Existing Structures

To strengthen the education and training structures will require action in a number of areas.

Training information systems. If individuals and enterprises are to be able to fit the available training opportunities to their needs, there needs to be a major development in training information systems, both in the Member States and at European level. A foundation stone of efficient markets is information about supply alternatives and eventually their price. A good start would be made if individuals and institutions had access to information on what is available. At the European level, the Commission is considering how to stimulate such information systems as part of the programme on Transeuropean Networks to be established to ensure that the Single Market can function effectively (see "Towards Transeuropean Networks", COM(90) 585).

Inter-institutional networks. Existing education and training agencies always need to cooperate so as to respond faster and more flexibly to the needs of individuals. There are plenty of examples of this process in the COMETT, ERASMUS and PETRA programmes, both national and trans-European.

Individual achievement profiles. The skills and competences which individuals accumulate during their lives are sometimes lost because qualifications are only recognised in discrete blocks, sometimes by examination or professional certification. Individual achievement profiles are now being developed in many Member States so as to facilitate a more individualised, flexible approach to individual skill achievement. Such an approach also is essential to the success of PETRA and FORCE.

Modular course construction. It is still necessary to train for many professions in three to four year courses in single institutions. This concerns mainly the initial vocational training. But this is not sufficient for the life-cycle needs outlined above. The flexible, life-time accumulation of skills needed by the majority of the population calls for a modular approach to course construction.

Open and Distance learning. All of the above features can be applied in open and distance learning, to which the Community has devoted considerable attention (see the Memorandum "Open Distance Learning in the European Community" COM (91) 388,1991). Distance learning systems are flexible, modular, networking education and training, addressed to the individual consumer and taking advantage of modern information and communications technologies. The distinction between "institutional" and "distance" learning is in fact likely to disappear.

Widest possible access. The systems including those established within enterprises have to be organized in such a way as to allow each individual an effective participation at every stage of their lives. On the basis of the Social Charter, the Council has approved a recommendation to provide effective access to training for all workers.

New roles for Higher Education. As the Memorandum on Higher Education stated, it should increasingly play an important part in continuing training. Furthermore, more flexible ways to gain entrance should be developed. Links with the local community should be strengthened.

These more flexible training methodologies call for a more open-minded approach to learning. Learning takes place in many situations, for example in any well-organised workshop or office, and not only through a teacher in a classroom. Youth and adult learning may or not be the same thing, but both young people and adults can learn in a variety of ways, including from one another.

The new provisions agreed in Maastricht, which incorporate education into the Treaty have opened the possibility of a more systematic cooperation between the Member States in education and training, supported and complemented by Community action. This will include the objective of building new bridges between education and training systems.

11.2. More Flexible Systems of Qualifications

Qualifications will play an important role for development of Europe's human resources.

A lifetime based on a first qualification is becoming the exception rather than the norm - and yet when our parents were young, initial qualifications were not only the means to livelihood but also the basis of the social structure.

Dynamic systems for developing the qualifications of the European labour force are needed. The main elements of such systems to which attention needs to be given appear to be the following:

- 1) Within frameworks agreed at national level with the Social Partners, qualifications benefit from being developed in close connection with the world of work, since the existing and emerging production systems are the major driving force. This implies close cooperation with education and training institutions at the various levels.
- 2) The recognition of work and training experience in the certification procedures is indispensable.
- 3) More weight should be given to the acquisition of

European provisions to facilitate mobility

Different provisions have been made to facilitate European mobility of workers.

1. Measures for recognition of diplomas

The legal recognition of diplomas concerns only the regulated occupations (professions). The objective of the recognition of diplomas at the European level is to remove legal barriers to the free movement of workers. A whole range of transitional and specific directives have been adopted since 1964 (e.g. doctors, nurses, architects). In order to accelerate and to improve the process, it was decided to achieve a general system of mutual recognition of diplomas. A first Directive (89/148 CEE - 21 December 1988) concerns the diplomas and certificates obtained after at least 3 years of higher education.

A further directive for a second general system of mutual recognition was adopted by the Council on 25/02/1992. It covers the diplomas and certificates involving less than three years' higher education. These systems are based on mutual confidence between Member states.

2. Comparability of Vocational Training Qualifications

For the non-regulated professions, and in order to foster mobility, non-binding information tools have been created. The comparability system of vocational qualifications aims at facilitating the free movement of labour by giving skilled workers

an opportunity to make better use of their qualifications to obtain access to employment within the European Community and by giving employers an improved knowledge and understanding of worker's qualifications.

The comparability of vocational qualifications is based on a Decision 85/368/CEE of 16/07/1985 and was dealt with in Council Resolutions in 1990 and 1992. The "products" of the comparability work are on the one hand a common description of a job profile and on the other hand, a table of the diplomas, certificates and other titles which can lead to this Community description. The progress to date has been that nineteen sectors have been selected for study and of these the results of eight sectors have been published in the Official Journal of the EC. The whole of the technical work is now completed.

An evaluation of the comparability work (objectives, use and value) has been carried out by the Member states; starting from this evaluation, the Commission is considering further steps in the context of its proposed new training programme.

3. European programmes

Many European Community Action Programmes for education and training have specific strands aiming at fostering mobility (ERASMUS, COMETT, and PETRA) and developing, of course, a wider European awareness.

generic skills, as a key element on which qualifications are built, since these are competences which can be applied to new jobs and professions.

Such developments will help European workers, young and old, to build up their qualifications in a realistic manner, corresponding to changing conditions of work and the problems they face as they move through their lives as well as to assist them in both geographical and occupational mobility.

11.3. Anticipating Skill Needs

Good information and analysis of skills and training needs will be a first stage towards supporting the social and economic cohesion and development of Europe.

As this Report has shown (see Part B), the capacity to analyse the qualitative and quantitative dimension of skills and qualification trends still needs to be developed. This concerns all levels: from the local to the national to the Community level, and the sectoral and occupational levels. Of course, this does not mean aiming for quantitative forecasts for each profession or type of occupation. But what is needed are forecasts of some aggregated trends in qualitative and also in quantitative terms.

However, given the very prominent role of human resources in socio-economic development and in mastering the challenges ahead, and the need to invest effectively in human resources, there is no alternative to the need for qualitative and quantitative analysis to anticipate skills and training needs. In addition, account must be taken of the long response-time of education and training systems to adapt to changing needs.

There is evidence that when analysing skills and training needs, the following principles could be followed:

- right from the beginning, a systematic approach is needed, involving all concerned in the process of analysis and anticipation. All respective actors should actively participate in the development of the work;
- sectoral and inter-sectoral (horizontal) analysis should be developed in the EC, involving research institutes, social partners and experts to identify the long-term trends in technology, work organisation, employment, skills and qualifications; regionally based skills needs

analysis is of great value. Such work should take account not only of the more general trends but also help to secure the link between supply and demand for education and training in the region concerned. The analysis could focus on the region's development prospects and the role that human resources, enterprises and the education and training systems can play in them. In guiding the analysis by means of a social process, involving the key actors in the region, more responsive and effective education and training provision can be achieved.

Cooperation at the European level brings advantages in two ways: firstly, by contributing to the capacity to anticipate and adapt required by the new role which education and training has to play in industrial adjustment, and secondly, at national, sectoral and regional level it will profit from mutual experience and knowledge thus avoiding duplication of effort while at the same time strengthening the European dimension.

11.4. Cooperation Between All Actors

In the previous chapter we noted that an analytical capacity needs to be organized as a social process. Two main reasons can be given: firstly, to improve the reliability of the analysis, and, secondly, to ensure the link to implementation. When those concerned are not involved in the process the danger is that no action will follow.

What is crucial and has to be established throughout Europe is the interface machinery between the different actors involved. This is the way to bridge the gap between supply of and need for skills. These interfaces need to be continuous, organised and efficient, and should cover all the ways in which skills are generated: in-firm, amongst firms, regional, sectoral, national and EC-wide. The thesis offered here is that there is no possible way to ensure a centrally planned supply of an appropriately qualified labour force. What is needed is an improvement in the analytical capacity by creating:

- a means for cooperation between those who demand and those who supply skills at all levels; and
- a quality revolution in education and training driven by the active involvement of all actors concerned and integrating the European level, especially in organizing cooperation and exchange of experiences, information and people. The Social Partners can significantly contribute to this process. It is for the regional and sectoral actors to implement the most promising results.

11.5. Special Provisions for Small and Medium Sized Enterprises

SMEs have specific training needs and special problems - action should be taken to support them.

The provisions outlined in this section are a necessary condition for competitiveness. But they may prove insufficient with regard to helping small and medium sized enterprises respond to the European Single Market.

From the EC regional projects (see Part B), some key problems of SMEs can be noted:

- problems with the recruitment and retention of skilled workers;
- lack of funds and time for training;
- giving the lack of in-house training, poor graduates make up a greater handicap for SMEs than for larger enterprises;
- SME's have a difficulty to identify and to express their skills and training needs, both in quantitative and qualitative terms;
- there is a lack of understanding of the processes by which skills are generated within a firm; and
- training providers tend only to read the strongest market demand signals - often diffuse or even absent in the case of SMEs.

These problems are more severe for SMEs in the less-developed Member States and in peripheral areas. Additional problems arise because the size of the local labour market may be too small to generate the skills needed; the cost of training provision in these regions may be too high; if available, training is often concentrated in the centres of population; and a lack of

coordination in planning between the different responsible public authorities is often a handicap. As a result, the task of building up efficient interfaces between demand and supply is particularly difficult.

No straightforward solutions to these problems exist but the EC regional projects have proposed some strategies:

- SMEs need help to identify their skills and training needs, to consolidate and to articulate them. Thus, they must organise or take part in a system (for example partnerships) which makes their demand coherent and amplifies its signals to training providers.
- intermediary organisations seems to be one answer. These would help SME's to define and address training needs but should not be imposed from the outside. It is important that SMEs identify their own objectives and are involved in their achievement.
- Regionally based agencies seem to be useful, i.e they can provide systematic surveys of the labour market, help firms to identify their skills and training needs and provide information about training opportunities. These should form part of a broader range of consultancy services in favour of SMEs.
- Other (larger) firms could become providers of training, especially for their suppliers, subcontractors and customers, thus helping to overcome some of the training problems of SMEs.
- Much more attention to national and EC actions is called for in order to improve training of trainers and to develop the capacity for innovation and improvements in in-firm and intra-firm training.

12. Creating the New European Dynamism

Europe is being faced with great opportunities. To succeed requires adjustment and adaptation. In a period where Europe's dynamism has lost some of its momentum, determined action on a number of levels is called for:

- to make the Internal Market function;
- to develop a vision of the future through means of anticipation;
- to provide a clear policy orientation, such as the one agreed at Maastricht, which will strengthen the means to achieve a prosperous and social Europe; and
- to make education and training a part of the environment needed to keep enterprises competitive.

The fundamental reality is that advanced societies and economies of the West have been propelled into a world in which competitive strength depends on a faster and more effective translation of new knowledge into productive activity. For most observers this is explained by a wave of new technologies which opens up new potential for economic growth. But the key point is that success in exploiting these new technologies depends on a favourable institutional environment in which education and training are of central importance.

Not only macro-economic policies, but increasingly micro-structural policies determine the capacity of economic systems to compete effectively. The United States, having been very successful in developing mass production techniques, is now losing ground to Japan, amongst other reasons because of the importance Japanese enterprises attach to human resources. Europe stands poised to secure the benefits of the 1992 Single Market if it can master the micro-structural changes which will improve the competitiveness of its enterprises and bring innovative products and services to the market. Yet, as this report and the recent report of the European Round Table of Industrialists make clear, Europe is lagging behind the field in the production of skills needed to make the jump to the new economic structures.

As a consequence, we need to add to policies favouring investment in fixed capital and in research and development the investment in human resources in order to master the challenges ahead and to contribute to the new dynamism which is urgently needed.

The EC Memoranda on Higher Education, Vocational Training Policies, on Open Distance Learning as well as the Guidelines for Community Action in Education and Training and this Report have shown in a coherent way the different approaches to developing the education and training systems which are possible.

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