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ABSTRACT

These three keynote speeches from a European Centre for the Development of Vocational Training (CEDEFOP) seminar "Research on Vocational Education and Training in Europe" focus on the links between education, training, work, and economic growth. "Education and Training Policies in the Transition towards a Global Information Society: Needs and Opportunities" (Eve Caroli) analyzes the links between new technologies, skill requirements, and economic growth. It promotes transferable skills as necessary in the transition to the information and knowledge based society and recommends integrating education and training policy on one hand and labor market and employment policy on the other. "The Relationships between Education, Training, Employment, and the Labor Market: Some Research Findings and Conclusions" (Manfred Tessaring) illustrates the positive contribution of education and training to earnings and economic growth as confirmed by a number of studies. It also discusses the opportunities and problems of identifying and quantifying new employment fields, occupations, and qualification requirements. "OECD [Organization for Economic Cooperation and Development] Activities Related to Research on Vocational Education and Training" (Abrar Hasan) addresses three issues: where the Vocational and Technical Education Project (VOTEC) work fits into OECD's broader mandate in the area of education and training work; a review of OECD's work in the VOTEC area completed in recent years; policy issues that have emerged from this work and the research gaps they identify; and an outline of the work the OECD is now planning in this area. (YLB)

CEDEFOP panorama

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Education, Training and Work
Research findings and conclusions

Papers from the seminar organised by CEDEFOP

Thessaloniki, 14 November 1996

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FOREWORD

You have before you a report containing the keynote speeches on the occasion of a Management Board seminar, "Research on Vocational Education and Training in Europe" held on 14 November 1996 in Thessaloniki and chaired by Mr. T. O'Dwyer, chairman of the CEDEFOP Management Board and Director-General of DG XXII of the European Commission.

Demographic change and poor growth in the economy and in employment evoke discussion over the role of education and training. The results of research on the impact technological progress, the restructuring of economies and the reorganisation of work have on vocational education and training were presented and discussed. Additional points on the conference agenda were the contribution vocational education and training can make to economic and employment growth, the implications of new jobs and changing skill needs.

But participation in VET also depends upon its attractiveness and the financial resources available, in other words, the costs and benefits to the individual, the government or the companies. These aspects merited discussion as did means for successfully integrating target groups in VET and the labour market who were excluded from acquiring qualifications and thus from stable employment.

Increasing difficulties VET graduates encounter in the transition to the labour market make "normal biographies" in education, training and work the exception rather than the rule. The seminar presented research results, highlighting underlying reasons and possible consequences to be drawn, for example with regard to continuing vocational training.

The ageing of societies and the rapidly changing technological and socio-economic environment call for ongoing renewal of skills through continuing training. Discussion here focused on whether education and training systems are sufficiently prepared to support and to invest in continuing training and to what extent there is need for reform.

One of CEDEFOP's project activities this year is to inform on research and development in vocational education and training in Europe. Towards of the end of 1997 CEDEFOP will produce a report with an overview of research relevant to key VET policy developments. This paper is a stepping stone to this report.

Johan van Rens
Director

INTRODUCTION

The links between education, training, work and economic growth were subject of a seminar held in the course of the CEDEFOP Management Board meeting of 14 November 1996 in Thessaloniki. The presentations of the three main speakers, Eve Caroli[1], University College London, Abrar Hasan[2], OECD, and Manfred Tessaring[3], CEDEFOP, summarised below, are presented in a slightly revised version.

In her contribution "Education and training politics in the transition towards a global information society: Needs and opportunities", ***Eve Caroli*** analyses the links between new technologies, skill requirements and economic growth. In spite of differing approaches to explaining these phenomena, most research studies come to the conclusion that skills and technical progress are interdependent and should be promoted in order to stimulate productivity and growth.

In response to the questions, "What skills are needed in the transition to the information and knowledge based society" and "How can they be provided?", "transferable skills" according to Eve Caroli is the first answer. The internationalisation of the economy, increasingly complex production processes and the growing need for information management are affecting the nature of work and working life. Changing jobs in the lifecourse with varying tasks and requirements demand skills which can be brought into play flexibly and productively.

Here the focus is on skills on the lower-intermediate level. To a greater degree than before, the curricula in these training courses - the dual system in Germany, apprenticeship training in Great Britain, and the vocational schools (CAP, BEP) in France - should provide transferable skills which prepare trainees to take on responsibilities and changing tasks.

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3 Executive Scientific Director at the Institute for Employment Research (IAB), Nürnberg; currently on leave as an expert working in CEDEFOP

The second issue, the provision of skills, concerns politics. Vocational training policy should no longer limit itself to running education and training institutions. It should moreover co-ordinate the provision of education and training (the "National Skill Producing System"), and the value placed upon skills and their use at work (the "Wage-Labour Nexus").

Linking both systems in a "Skill-Labour Nexus", poses the challenge of integrating education and training policy on the one hand, and labour market and employment policy on the other, as well as the different institutional responsibilities.

In his paper "The links between education, employment and the labour market: Some research findings and conclusions", ***Manfred Tessaring*** illustrates the positive contribution of education and training to earnings and economic growth as confirmed by a number of studies.

The implications for employment growth are more long-term through improving productivity and competitiveness and the successful mastery of structural change. In the short- and medium-term, employment can be increased only through a package of various economic strategies.

However, successful employment policy alone cannot automatically eliminate structural unemployment if caused by a mismatch of qualification and requirement profiles, and intensified by rapid technical progress and long-term unemployment. To overcome the problems of structural unemployment, skills are required which enable people to adjust to structural change. Priority should be given to transferable and polyvalent skills in view of the unpredictability of specific occupational profiles demanded on the labour market.

Basic orientation in education policy requires at least a global view of future qualification structures. Forecasts for a number of European countries correspondingly show that the restructuring of employment goes hand-in-hand with a growing demand for more highly qualified workers. Lower skilled or unskilled people are expected to have only poor opportunities in finding stable jobs with prospects in the future.

Manfred Tessaring also discusses the opportunities and problems of identifying and quantifying new employment fields, occupations and qualification requirements. In his view it is important to distinguish between quantitative (net) employment gains and qualitative changes of occupational tasks and skill requirements. He concludes with some remarks concerning the transition from training to the labour market which has become increasingly difficult in almost all European countries - in spite of the rising level of training among the young generation. Education policies favouring specific qualifications aimed at making people immediately productive should be, however, not the solution. Consideration should rather be given to how a combination of polyvalent, transferable and practical training elements can facilitate the process of integration into working life and thus overcome the conflict between mobility and productivity.

Abrar Hasan presents an overview of OECD's past and future activities in the field of vocational training.

The focal issues of OECD's VOTEC (Vocational and Technical Education) project 1990-1994 dealt with the role of vocational education and training, its development and its relation to other social areas in an international comparison. National reports and conferences - as documented in publications - looked at the relationships between general education and vocational training, at pedagogical and organisational aspects, at the evaluation, certification and recognition of qualifications and skills, and at the on-and-off-the job vocational education and training ("alternance").

The findings of the VOTEC Project point to a number of open questions concerning vocational training. Abrar Hasan outlined the core problems as follows:

- What combination of general and practical education and what type of pedagogical and institutional structures are required?
- Does an open, permeable education system, with flexible "pathways", weaken vocational training?
- How can vocational training be put on a par with academic education?
- Should the validation and certification of vocational training be market-oriented or is there a need for social consensus?
- How can the conflict be solved between continuing adaptation/modularization of vocational training, and stable, well-defined qualifications?
- Are the costs and benefits of vocational training equally distributed and how does the state treat vocational training compared to academic training?
- How can returns to vocational education and training be secured, continuing training be promoted and in what way can the motivation of individuals and enterprises to undertake and to invest in training be increased?

In its future work OECD will examine vocational training in the context of other problem areas. In 1996 "Life-Long Learning for All" was set as a future focal area of OECD's work (1997-2001). In this context, the traditional training objectives are to be brought into line with the new challenges of the labour market.

In addition to the aspect of life-long learning, the following OECD projects are linked closely to vocational training:

- Flexible enterprises, new forms of work organisation and their implications for human resource practices;
- Non-financial reporting by firm on human resources as part of the project: "The Measurement of Human Capital Investment";
- Transition patterns of the age cohort 15-29 from school to working life.

EDUCATION AND TRAINING POLICIES IN THE TRANSITION TOWARDS A GLOBAL INFORMATION SOCIETY: NEEDS AND OPPORTUNITIES

Eve Caroli

Our debate today focuses on the changes required from the systems of Vocational Education and Training (VET) in Europe due to the very rapid pace of ongoing economic and technical change. So, in my presentation I would like to raise two questions starting from one observation. This observation is that new technologies are spreading and in particular ICTs (Information and Communication Technologies), which set the grounds for an Information Society or Knowledge Based Economy.

The first question I would like to address is: what are the consequences of these changes in terms of skill requirements? What do economic theory, as well as econometric analysis, tell us about this question? Can they be of any help in assessing the nature and the level of the new skills required (if any), in the transition towards an Information Society? We will see that, for the time being, economists are not perfectly able to disentangle the relationships between new technologies and skills. However, work has been carried out far enough to provide a few results, which indicate that new skills and, in particular highly transferable ones, are definitely needed in the transition towards an Information or Knowledge Based Economy.

Starting from this requirement, the second question I would like to address is: how can VET systems improve their outcome? That is, what kind of policies may be devised in order to raise the skill level of people graduating from VET? Here again, we will see that economic theory provides us with a few interesting results, especially when relying on an institutional approach of VET.

1 Technical change and employment structure

For several years now, most OECD countries have been experiencing two deep changes, both in the nature of technical change and in the employment structure.

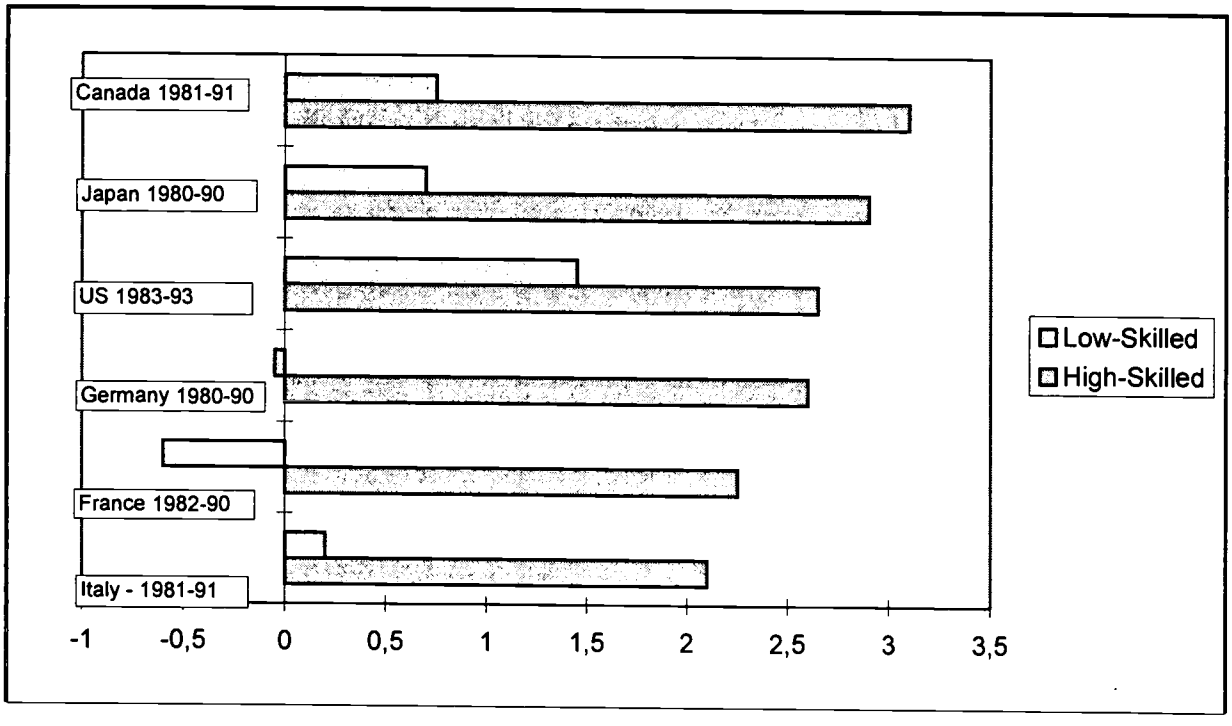
As concerns technical change, the main characteristic of the ongoing evolution has been the rapid and widespread development of information and communication technologies (ICTs). These new techniques generate, very classically, new products and processes. But, as we shall see, they also generate changes in the very nature of work itself.

In parallel, industrialised countries have also been facing an important upward evolution in their job structure: the proportion of high skill jobs has been tremendously increasing over the 1980s *(see figure 1)*.

So, in most OECD countries, employment has been growing much faster for skilled workers than for unskilled ones in the 1980s, leading to an upward evolution in the employment structure.

Figure 1

Employment growth of high skilled and low skilled workers [1]
Average annual growth rates



[1] "High skilled" workers are defined here as those in the following occupational groups: Legislators, senior official and managers (ISCO-88 Group 1); professionals (ISCO-88 Group 2); technicians and associate professionals (ISCO-88 Group 3). All remaining occupational groups are classified as "low-skilled". For Germany, ISCO-88 Group 1 covers legislators and senior officials only and ISCO-88 Group 3 excludes Teaching associate professionals so that high-skilled workers are underestimated.

Source: OECD Secretariat estimations from national data (STI/EAS Division).

One of the first questions to be answered when dealing with skill requirements and their potentially changing nature is: are these two evolutions - namely the spreading of ICTs and the upward evolution in the job structure - connected to each other. And if so, in which way?

On this point, the first type of evidence put forward by researchers has been dealing with the evolution of wages. Indeed skilled workers' wages have kept increasing despite the rise in the number of skilled people. (Mincer 1993, Abramovitz and David 1994). This has been interpreted, in a very classical way, as signalling an increase in the demand for skilled labour due to the spreading of new technologies. Indeed, if the price of skills keeps increasing while its supply rises as well, this must be due to an increase in demand, itself the consequence of skill-biased technical change.

This is confirmed by the fact that wages have increased more slowly in low skilled jobs than in high skilled ones. This has been the case in quite a large number of OECD countries, yielding an important increase in wage inequality *(see figure 2)*.

Figure 2

International 90-10 Wage Ratios between 1980 and 1990 (Men)

Country	1980	1990
Australia	2.01	2.23 ↗
Austria	2.61	2.75 ↗
Belgium	1.90	1.92 ↗
Canada	3.48	3.98 ↗
France	3.25	3.21 ↘
Germany	2.45	2.32 ↘
Italy	2.12	2.08 ↘
Japan	2.59	2.84 ↗
Sweden	2.15	2.15 →
UK	2.53	3.21 ↗
US	4.76	5.63 ↗

Ratio of the 90th to 10th percentile of the wage distribution
Source: Mackin 1994

This has been the case in Australia, Canada, Japan, the UK, the USA, Austria and Belgium, thus providing indications of upskill-biased technical change.

However, this interpretation based upon the nature of technical change, has been challenged.

First, advocates of the Screening Theory (Spencer 1973) deny any link between wages and the evolution in the supply of skills on the one hand, and skill requirements of new technologies on the other hand. According to them, firms do hire people with high educational levels and pay them more, but this is not due to any positive influence of skills on workers' productive performances. What happens is that firms do not know workers' productivity by the time they hire them. So, they use their educational level or training achievement as a signal (an indication) of their potential efficiency.

The underlying assumption is that people are naturally "gifted" and this gift is not modified by education. Of course one additional assumption is that those workers who are "gifted" are so, both for studies and for production, which makes it rational for firms to try to infer their potential productivity from their educational achievement. According to screening theorists, education is thus used as a screening device, a filter, whereas its impact on productivity is most uncertain. This yields the observed upskilling of the labour force. However, this signals nothing but *overeducation* and therefore cannot be interpreted as reflecting the need for more skills due to the development of ICTs.

A second line of criticisms stresses that quite a few explanations can be put forward in order to account for wage inequalities and that the evolving nature of technical change is only one of them. In particular, some scholars underline that most developed countries have been facing deep institutional changes over the past 20 years and that these would have contributed to the widening of the skilled/unskilled wage gap (Howell 1996). According to these authors (see Capelli 1995) there is evidence that many employers have been adopting low-wage human resource strategies by the late 1970s, including relocation of activity to low wage sites, hiring of part-time, low paid, temporary workers. This has contributed to undermine the traditional wage-setting institutions that had been protecting low skilled workers; thus setting the ground for a decrease in their relative remuneration.

These criticisms have created a strong incentive indeed to investigate into more direct relationships between the nature of technical change and the upskilling of the labour force.

An important empirical literature has developed on this issue which displays a fairly strong link between the development and use of new technologies on the one hand, and the rising skill level of the labour force on the other hand. Basically these studies use two types of data: firm and industry level data.

Using firm-level data:

- Siegel (1995) displays a positive correlation between labour quality indices and computer expenditures
- Nyholm (1995) as well as Doms et al. (1995) show that the more technologically sophisticated establishments employ more highly educated people.

At the industry level:

- Wolff (1996) shows that computerisation has a positive impact on the share of highly educated information workers in the US
- Bernt et al. (1992) and Berman et al. (1994) also display a positive correlation between high-technology capital intensity and the share of high skilled white collar workers in employment.
- Similar results are also obtained by Colecchia and Papaconstantinou (1996) for a large set of developed OECD countries.

On the whole, recent empirical work, carried out both at the firm and industry levels, displays a strong complementarity between the use of new ICTs and the skill level in the labour force.

However, the very nature of this complementarity proves difficult to assess. Do new ICTs require higher skills? Or, on the contrary, do highly skilled workers allow for the use and/or the development of new technologies? In other words, what is the direction of the causality? This question has not yet been answered by econometricians. They are able to display a strong correlation between both variables but the causality issue remains unsettled.

However, although this is definitely an interesting and important empirical issue, it is not really relevant neither from a practical nor from a theoretical point of view. The very reason for this is that we know that both skills and technology are important determinants of micro productivity as well as of macroeconomic growth. At the micro - firm - level and despite the criticisms of screening theorists, Human Capital Theory has convincingly stated that education and training makes workers more productive (Becker 1965). In parallel, economists of innovation have shown since a long while now that technological change strongly improves firm's performances, both in terms of productivity and competitiveness. Similar results have been displayed at the macro (country) level by endogenous growth theorists. R. Lucas (1988) and P. Romer (1990) have shown that human capital as well as technology are major engines of the growth process, in the long run.

So, from the theoretical as well as from the practical point of view, the only important point is that skills and new technologies enhance each other, and that both should be developed in order to foster economic growth.

2 Skill requirements

Even though the precise direction of causality between ICTs development and skills is not a major issue, we need to go one step further in the analysis of their relationships in order to assess what kind of skills are needed in the transition towards an Information Society.

In this respect, researchers have shown that ICTs tend to require higher skills for two main reasons.

- The improvements in the means of communication made possible by the development of ICTs tend to ease the internationalisation of production. So, a large part of the activities requiring unskilled labour can be relocated from industrialised to developing countries. As a consequence, firms' requirements in terms of skills tend to raise in the latter.

  So, in this view, the emergence of a global information society - due to the development of ICTs - first increases the need for skills in OECD countries through its stimulative impact on international competition.

- A second reason for the positive complementarity between skills and ICTs is that the role of information processing is becoming crucial in the production process. This feature of new technologies has been pointed to by P. Ryan as early as 1987 in his far-seeing OECD Monograph.

  Since then, a lot of studies have been carried out which definitely confirm this trend. Capital equipments tend to become more fragile, so that workers must be able to cope rapidly with a large span of unforeseen difficulties arising in the production process. In this context, an efficient reaction requires a good capacity of synthesis as well as the ability to communicate with peers in order to assess the origin of the breakdown. Moreover, workers must be able to handle the increasing amount of information processed in the production activity as well as to take initiatives in order to adapt the production process to an increasingly unstable demand. This requires from them a high degree of polyvalence.

The direct consequence of this is that workers - either white or blue collars - need highly transferable skills together with a good educational level. Given the rapid pace of technical as well as of economic change, they will be forced into changing activity, and may be job, several times in the course of their working life. So, they need to be endowed with a good general educational background which will help them adapt to new activities. Moreover, as we have seen, in each job a high degree of polyvalence is required, thus calling for highly transferable skills.

So, I would argue here that there is basically no trade - off between flexibility and productivity. Of course, in the very short run, very specific skills may prove more efficient for one given task. But since workers have to participate more and more in various tasks, in a dynamical perspective, even in the short run, they need general as well as transferable knowledge in order to be efficient. This is all the truer in the long run since new technologies are a major engine of economic growth. So, a careful scrutiny at the characteristics of new technologies shows that there is no trade - off between flexibility and productivity at least in the medium run. The only trade off (if there is one) is between a static and a dynamical view of economic development.

Starting from the fact that a high level of transferable skills and a good general educational background are required from workers in the transition towards an IS, the last question I would like to address is: How

can these skills be provided? What can be done in order to improve the education and training level of the workforce?

This question is particularly crucial for those workers with "lower intermediate skills". According to the definition proposed by the British National Institute for Economic and Social Research, lower intermediate skills are acquired at work as well as in secondary level VET, that is

- in the Dual System or in full-time technical higher-schools in Germany;
- in the Apprenticeship system or in the various Youth Training Schemes (YTS) in Great-Britain;
- and in CAP and BEP curricula in France.

They usually amount to quite narrow competencies: workers with lower intermediate skills have typically learnt how to perform a defined series of tasks, but are not really prepared to take responsibilities nor to adapt to different activities. As we have already seen, these turn out to be decisive capacities in order to be able to cope with the requirements of spreading ICTs. Therefore, the average level of intermediate skills definitely needs to be increased so that most, if not all, workers be endowed both with broadly transferable skills and with a good capacity to adapt and to learn.

This is the objective. How is it to be achieved?

3 Skill production and Wage-Labour-Nexus

The nature and potential efficiency of the measures that can be suggested in order to enhance intermediate skills strongly depend on the analysis of the determinants of the skill level. In this respect, the institutional approach provides interesting results which fruitfully complement those displayed by a more traditional approach.

The traditional approach to the determinants of the skill / educational level has been developed in the 1960s and 1970s.

It is very "school oriented" and consists mainly in estimating educational production functions: scholars try to determine which are the main factors influencing pupils' scores at various schooling tests. The first results - Coleman 1966 - surprisingly show that there is no systematic relationship

between school expenditures and students' performances. The main determinant of students' scores is definitely the family or social background. So, the first policy implication that can be drawn from these results is that educational policies should not be restricted to the allocation of funds to the schooling system and have to encompass an important social dimension.

However, more recent studies display the need for a minimum funding of the schooling system. Card and Krueger (1992) show that the quality of schools as well as of teaching conditions positively influences future earnings of students. Since these at least partly reflect the productivity of workers, schooling expenditures appear to enhance students' general ability.

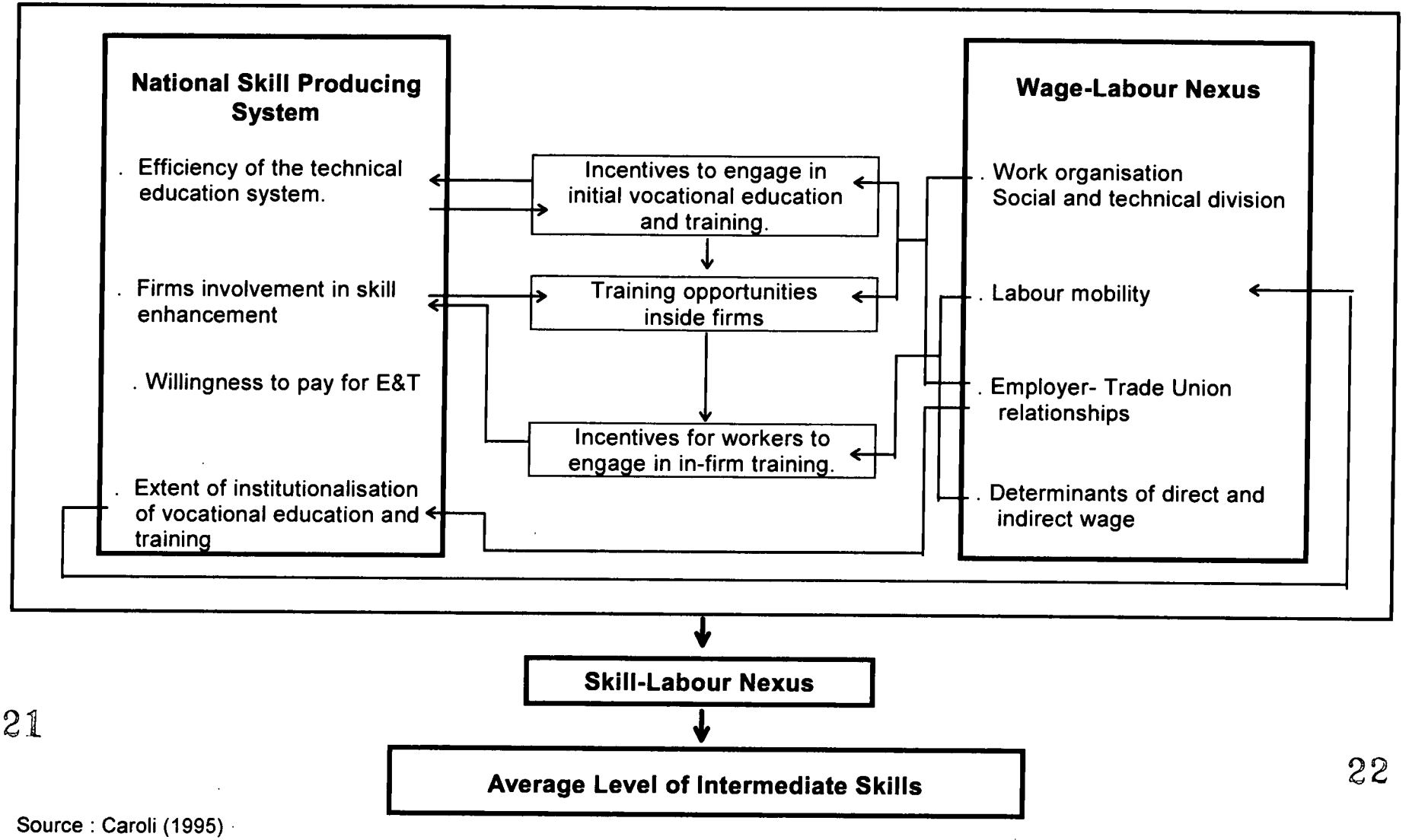
So, the traditional analysis in terms of educational production functions suggests two types of measures likely to enhance the average level of intermediate skills, since these are partly acquired at school. The first ones should focus on the social environment of pupils - social policies - and the second ones should ensure a minimum quality of the schooling system. Even though they are fairly different in their precise content, these two policies share an important feature: they are both school as well as supply-side oriented. But this is only part of the answer since intermediate skills are also acquired at work.

This feature is explicitly taken into account by the institutional approach. This suggests that production and valorisation of human resources are closely interconnected. In fact, they articulate to each other to determine the national level of intermediate skills.

Indeed, on the grounds of a fairly detailed study of education and training systems in 5 OECD countries, one can show - Caroli (1996) - that the level of intermediate skills in the workforce depends both on the characteristics of the National Skill Producing System and of the Wage - Labour Nexus *(see figure 3)*.

Figure 3

SKILL-LABOUR NEXUS AND THE AVERAGE LEVEL OF INTERMEDIATE SKILLS



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Source : Caroli (1995)

The National Skill Producing System can be defined as the combination of 4 elements:

- the efficiency of the technical schooling system
- firms involvement in skill enhancement
- the willingness to pay for education and training
- and the degree of institutionalisation and codification of education and training

Of course, I do not have time to go here into any detail about these four elements. Let me just stress that each of these elements may undertake different forms which determine the efficiency of the National Skill Producing System.

In a similar way, the Wage - Labour Nexus is also defined with reference to four elements:

- the organisation of work inside firms
- the forms of work mobility
- the nature of Employers / Trade Union relationships
- the determinants of direct and indirect wages.

The precise form of these elements may also vary and determine the more or less co-operative nature of the wage-labour nexus. In turn, both institutions articulate into a Skill-Labour Nexus which determines the average level of intermediate skills in the economy.

The crucial influence of the National Skill Producing System on the level of intermediate skills is quite intuitive since its four components mainly characterise the general conditions of skill production. The major influence of the Wage - Labour Nexus is probably less intuitive. One can, however, point out three main channels for its influence:

A. A co-operative Wage - Labour Nexus tends to increase training opportunities inside firms since the organisation of work will be less hierarchical and thus more qualifying.

B. When internal mobility criteria and wage formation do recognise technical skills, workers are strongly incited to invest in training.

C. The image of VET is all the better that firms do really value intermediate skills which, in turn, improves the quality of the students engaged in these curricula and therefore the corresponding skills.

4 Summary and Conclusions

This is only a very rapid overview of the institutional analysis but it shows you that the main result is that the characteristics of the National Skill Producing System and the Wage-Labour Nexus articulate in order to determine the level of intermediate skills.

This suggests a few implications for policies designed at enhancing intermediate skills.

Given the very close articulation of production and valorisation factors in the determination of the level of intermediate skills, policies should not be restricted to supply side measures. Of course, supply side measures are crucial. When a country wants to raise its level of intermediate skills it must definitely try to improve teaching and training conditions. But, it must also try to enhance a more co-operative Wage-Labour Nexus.

Indeed, one of the main results put forward by the institutional approach is that the efficiency of any skill policy is heavily dependent on its consistency, that is, on its ability to articulate measures focusing both

- at the National Skill Producing System, that is at the supply side
- and at the Wage - Labour Nexus, that is at the demand side.

As a consequence, European and OECD countries are currently facing a major challenge. If they want to cope with the requirements of spreading ICTs - that is if they want to be able to produce the fairly general and highly transferable skills that are needed - they must engage in a profound political revolution.

What I mean here is that they must articulate, and probably integrate two types of policies which are usually implemented by different institutions. Namely they must integrate schooling and training policies on the one hand with labour market and work policies on the other. And this is not a minor challenge.

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THE RELATIONSHIPS BETWEEN EDUCATION, TRAINING, EMPLOYMENT AND THE LABOUR MARKET - SOME RESEARCH FINDINGS AND CONCLUSIONS

Manfred Tessaring

Given the limited time available, this contribution can only touch on some aspects of the complex relationship between education, qualification, growth and employment. The starting point is the question, "Do education and training promote employment and help to reduce unemployment?". In this connection the following subjects will be addressed:

- The benefits and costs of education and training and their contribution to economic growth and employment.
- Some causes of persistent unemployment in Europe and how training can help to overcome them.
- Possibilities of forecasting qualifications and of identifying new employment and occupational fields.
- Problems related to the transition from training to working life.

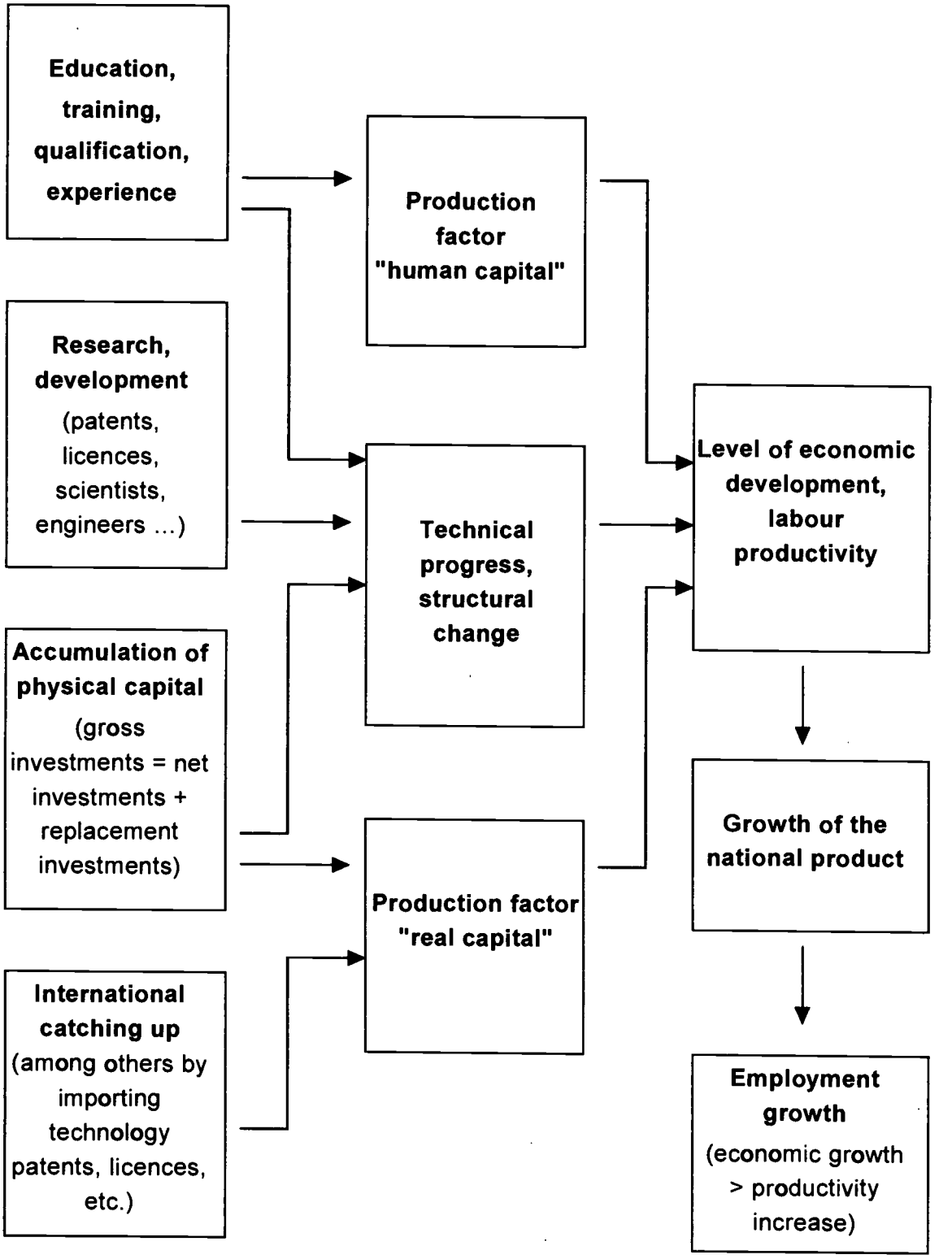
1 Contribution of education and training to economic growth

Identifying the contribution of education and training to economic growth or analysing the private and social costs of and returns to higher qualification of the (active) population is a task for the economics of education and the New Theory of Endogenous Growth. Unlike traditional growth theories, the new growth theory explicitly includes technical progress and its determinants in addition to real capital and labour.

The main factors which influence endogenous technical progress are research and development, innovation and, more particularly, the level of training, qualification and skills of the labour force, i.e. the human capital. These links are presented in *Figure 1*.

Figure 1

Factors of influence to economic growth and employment:
"The New Theory of Endogenous Growth"



Source: Based on Graff, 1995

Since the 1960s most of the analyses in the field of the economics of education in respect of the individual and social benefits and costs indicate a considerable contribution of education to income and economic growth. Equally, almost all current analyses of endogenous growth confirm this positive effect. Some research findings from the last few years are shown in the annex.

However, it should be added that most of these studies refer to general education and very little to vocational training. Although the latter does also contribute to economic growth, its contribution seems to be far smaller than that of general or higher education.

This may be attributable to the higher costs of vocational training, changed skill requirements as a consequence of structural change and possibly to insufficient adaptation of the curricula of vocational education to labour market requirements. Within vocational training the economic returns to practical or in-plant training seem to be slightly higher than those to in-school training.

In conclusion, these findings reflect that vocational training does not yet enjoy parity of esteem with general education and is linked to lower income and career opportunities. Determining the returns of vocational education and training is very definitely a research field which in my opinion has not been adequately addressed yet and which should be at the top of research priorities.

The same applies to the immaterial returns to education and training. These could be external returns, for example better education thanks to more educated parents, or costs which could be avoided thanks to a lower level of criminality, improved health, greater environmental awareness, etc. Their correlation with education has been proved but quantifying the precise returns causes considerable difficulties, of course.

2 Contribution to employment

The next question is whether and under what conditions an increase in economic performance, which is influenced also by education and training, could increase the level of employment. The answer is apparently simple. A rise in employment can be achieved when:

- in the short and medium term, economic growth exceeds the rise in productivity;

- in the longer term we succeed in mastering structural change in the course of which non-productive companies and jobs are displaced by productive and innovative ones. This in turn improves the international competitiveness of an economy which is an essential basis for creating new jobs or safeguarding existing ones.

It should be stressed that in the short and medium term, growth in employment can scarcely be achieved by means of more education and training but above all by means of investment. Investments and employment can be promoted by accompanying measures in the field of economic, financial, monetary and wages policy. E.g. latest scenarios developed by the Institute for Employment Research (IAB 1996) for Germany have shown that a substantial growth in employment and a reduction in unemployment can best be achieved through a package of strategies, for example wage and working hours policies (for example reducing overtime and working hours, increasing the share of part-time employment), the cutting of subsidies and by lowering interest rates. If these strategies were to be pursued in a consistent manner, unemployment in Germany could be reduced by 50 % within the next five years.

Concluding, education and qualification have a major effect on economic growth only in the longer term. Whether this will also lead to an increase in employment and create new jobs depends above all on productivity and the degree of success in mastering structural change. In the longer term, however, there is no alternative to an increase in productivity and, by extension, in the skill level of the population.

3 Contribution to reducing unemployment

Following these comments on the contribution of education and training to economic growth and employment, the question arises whether an increase in employment also helps to reduce unemployment. I would like to say right now that an increase in employment need not automatically reduce unemployment as we have seen in the 1980s and 1990s: many countries have had the highest level of employment since World War II but at the same time the highest level of unemployment.

How can we explain this paradox?

Firstly, we should bear in mind that "employment" is related to jobs whereas "unemployment" also takes in the potential "supply" of workers. If, for example, for demographic reasons or on account of rising immigration, the labour force potential increases to a greater degree cet. par. than the number of jobs available, then this may lead to unemployment. Hence, it would be a fallacy to assume that an increase in job numbers would automatically reduce unemployment to the same extent.

Now we could assume that unemployment could be reduced by both increasing the number of jobs and reducing the size of the working population by means, for instance, of a restrictive immigration policy, family support, extension of times spent in education and training, part-time work or lowering the retirement age.

A dual strategy of this kind will not automatically lead to success either and unemployment may persist, for example, in case the profiles of the two sides, that is the skill requirement profiles of jobs and the qualification profiles of the applicants, do not match in specific areas. Then we are dealing with structural unemployment.

The phenomenon of structural unemployment, which confronts most European countries today, cannot be sufficiently explained either by post-Keynesian or neo-classical theories. A second closely related phenomenon is that from recession to recession the hard core of unemployment tends to increase and cannot be completely reduced at a later stage, even when the economic situation has improved and there is a sufficient number of vacant positions. Research into these phenomena of structural and persistent unemployment explains these by "mismatch unemployment", "segmentation", "hysteresis" and "insider-outsider behaviour".

Training and qualification now enter the scene as important parameters.

Mismatch unemployment consists in particular of structural unemployment, i. e. above average unemployment in certain occupations, economic sectors, regions or qualifications. Whereas in one area there may be a shortage of manpower, in another there exists a high level of unemployment. This phenomenon appears particularly in periods of rapid structural change in the course of which laid-off workers in one sector or profession (for example in agriculture or industry) or with specific skills do

not succeed in switching easily to other sectors (for example, services) which may have a shortage of skilled manpower and in meeting the requirements there. This problem is particularly acute when the qualification profiles are oriented towards specific companies and activities.

Another explanation for the persistent nature of unemployment and, in particular, of long-term unemployment is given by the "hysteresis theory". It attributes the increase in the volume of the long-term unemployed which even in a favourable economic climate can only be reduced with delay, to the fact that in a recession there are selection processes going on and unemployment becomes a stigma. Furthermore, many unemployed become demoralised and gradually lose interest in seeking jobs. Another main reason might be that employers suspect that these applicants have a lower level of productivity. Specific skills become even more obsolete the longer individual unemployment lasts and the more rapidly the job requirements change, e.g. as a consequence of the introduction of new technologies.

This leads to the formation of a segmented labour market which is divided into a segment with stable employment for qualified core staff and a segment of peripheral workers who have a lower skill level and are threatened by unstable employment conditions and dismissal. On a labour market of this kind the opportunities for integration of the long-term unemployed, but also of new entrants to the labour force, are particularly problematic. Furthermore, the "insiders", those with a favourable job, may not necessarily be interested in "outsiders" being hired since they might threaten their employment and wage position.

One interim result is that education and, more specifically, training can help to reduce unemployment by

- promoting the reintegration of the long-term unemployed and disadvantaged people into working life by means of further training, retraining and related schemes;

- softening the effects of structural change on unemployment and low-level employment by imparting broad and transferable skills.

In order to master structural change, in the short and medium term retraining and further training activities are required, in the longer term anticipative reforms of the training system to prevent structural unemployment. This also calls for forecasts of the qualification structure

of the labour force and of jobs, for analyses of appropriate measures and of their efficacy to help avoid imbalances on the labour market.

An anticipative balancing of education and employment, of course, will not prevent unemployment if it is seasonal or cyclical in nature. However, it can make a decisive contribution to reducing its structural components and to avoiding persistent unemployment related to a mismatch of skills.

4 Forecasts of occupational and qualification structures

As already mentioned, preventive education and labour market policy is dependent on some notion about the future, i. e. on possible future developments and structural changes in the employment system and in qualification requirements. Forecasts of this kind may be of a quantitative-structural nature; the determination of future "innovative" qualification contents by contrast is an area covered by occupation-related pedagogic and curricular research.

I would like to restrict my comments to the field of socio-economic structural forecasts and present some results for four European countries. In Europe relatively few research institutes undertake quantitative forecasts of occupational and qualification structures. This is perhaps attributable, on the one hand, to the lack of suitable or available statistical data and, on the other, to a certain scepticism concerning the reliability and the relevance of forecasts.

To a certain extent I share the opinions of the sceptics but I would like to qualify this statement. The decisive question is how a forecast was put together and for what purpose it is used. Forecasts may be useful for political reasons and decision making when, for instance future alternative development lines and the effects of certain measures are to be predicted. Forecasts may also function as a warning by outlining in what direction a development will go if no countermeasures are taken in time. In this case the forecaster might be happy if his prediction is not to become reality.

On the other hand, forecasts may be detrimental, particularly when they serve as a decision-making basis for young people's choice of training or occupation. This may lead to counteractive developments: the forecast destroys itself.

Given these reservations, please let me briefly present the findings of some forecasts from recent years for the Netherlands, the United Kingdom, Ireland and Germany.

Forecasts of demand and employment prospects for people with completed education and training in the *Netherlands* have been made in particular by the Research Centre for Education and the Labour Market (ROA). The period covered by the most recent forecast extends up to the year 2000 (cf. ROA 1995).

The forecasts show a continuing trend towards the service sectors and "higher level occupations". The largest increase in demand and, depending on the type of training, the best career prospects are expected for higher education (including higher vocational training). It is forecast that the demand and thus the job prospects for semi-skilled or unskilled workers will drop considerably. For the intermediate level, i.e. initial vocational training and apprenticeship, there is a slight but not above average increase. People with these qualifications, according to ROA, will increasingly be recruited for jobs which hitherto have been held by workers with a lower level of qualification.

ROA draws the following conclusion: "The overall employment share of Intermediate Vocational Education and apprenticeship training is not expected to increase any further in the coming years, but there are large differences between the various types of education at this level. Positive effects on employment levels derive mainly from the progressive upgrading of skilled labouring work. A qualification at the Intermediate Vocational Education level is increasingly becoming the minimum requirement for skilled labourers." (ROA 1995, p.VI)

For the *United Kingdom*, forecasts are available up to the year 2001 from the Institute for Employment Research (IER) (cf. Wilson/Webb 1995).

IER expects the structural trends in the employment system which have been observed so far to continue. They are characterised by a shift in employment from the manufacturing sector to services and, more specifically, to private services and the education and health sector. IER expects, as a consequence, an ongoing increase on demand for highly qualified white collar occupations, in particular for senior occupations in the civil service and industry, and for scientific-technical and related occupations.

The prospects for craft trades and production trades are viewed rather pessimistically. The forecasts mainly indicate a surplus of workers at the intermediate qualification levels which will be even greater in the case of the semi- or unskilled. This may be due to several reasons: crowding out of those on the intermediate level by people with a high level of qualification, surplus of people with qualifications in the intermediate levels, with the consequence that workers with intermediate qualifications are being pushed into jobs with lower skill requirements.

Since not enough research has been done on these processes IER comes to the following conclusion: "At the intermediate level, there is also a particular need for more research ... into the relationships between those jobs (on the intermediate level) and others above them and below them. This is because some intermediate occupations are developing as complements to more highly qualified personnel, and others as substitutes ..." (Lindley 1994, pp. 95/98)

The forecasts for labour demand according to sectors, occupations and qualifications up to 1998 for *Ireland* as made by the Economic and Social Research Institute (ESRI) show in a manner similar to those for the United Kingdom that growth in the services sectors will lead to a growing demand for people with a higher level of qualification (Canny/Hughes 1995). There will be a growth in occupations especially in the area of management and the self-employment, scientific-technical and related occupations, as well as on the intermediate level of qualified sales, security and service occupations. Downward trends in demand are expected by contrast for agricultural occupations, blue-collar occupations and master/foreman occupations.

These trends are linked to a rise in demand for people with general and vocational secondary school-leaving certificates or people who have successfully completed university or non-university higher education. This will be offset by a drop in the need for workers on the intermediate qualification level and is more or less zero for people only having completed school education, or initial training.

ESRI draws the following conclusion: "The evidence for Ireland points to the growing importance of educational qualifications in a labour market which is becoming increasingly white collar. It suggests that there will be a need for a labour force in the future which is well educated and highly skilled. It will become increasingly important that poorly qualified workers presently in the workforce be given opportunities to attain further educational qualifications and/or training and it is vital that all school leavers should be encouraged to remain in school and attain

qualifications which will equip them to take advantage of the new and expanding opportunities which are opening in the labour market." (Canny/Hughes 1995, p.27)

Four forecasts which are relevant in this connection have been made in recent years for *Germany*. They extend up to the year 2010:

- The IAB/Prognos forecast for West Germany (Prognos 1989) also takes in the technical and socio-economic influences on work tasks and, by extension, the job requirements. It shows a clear structural shift towards the services sectors and, more specifically, to "secondary" service activities. These are tasks which are further removed from goods production and, as a rule, require a high level of qualification. No forecast was undertaken of the qualification structure.

- An update of the IAB/Prognos forecast, linked with a forecast of qualification needs in West Germany (Tessaring 1994) comes to the conclusion that the demand for higher qualifications (university, "Fachhochschulen"/polytechnics) will increase considerably. Employment for unskilled labour could be reduced to half of the current level. Growth in employment is expected on the level of initial vocational and further training, but will not be above average.

- For various reasons, a forecast of the labour demand according to sectors, occupations and qualifications by Weisshuhn et al. (1994) comes to conclusions which deviate in part from the last-mentioned forecast, above all, because of varying data bases and forecast methods. However, the main lines are confirmed: employment amongst the "unskilled" is expected to decrease dramatically and the demand for university graduates to increase above average. For the level of initial vocational training and further training, slightly higher employment growth is expected. These findings are valid for both West and East Germany.

- The Federal-State-Commission for Educational Planning and Research Promotion (BLK, 1995) has added forecasts of labour supply, broken down according to qualification levels, to the two last-mentioned demand forecasts. By balancing the supply and demand forecasts it becomes evident that a high demand surplus is to be expected at the level of unskilled workers coupled with poor employment opportunities. For university graduates there may emerge, depending on the projection variants, a more or less high supply surplus, and a shortage of manpower with intermediate qualification levels.

However, BLK is warning against overestimating forecasting balances of this kind. For instance, substitution and mobility processes were not given sufficient attention in the forecasts. It is to be expected that qualified workers on the intermediate level will increasingly hold jobs which previously had been filled by unskilled workers. On the other hand, university graduates or, in particular, "Fachhochschul"-graduates will be entering some segments of the labour market which previously had been occupied by people who had completed initial or further continuing training.

By way of summary, it can be said that despite different methods, delimitations and educational systems of the four countries under consideration, the forecasts come to the conclusion that structural change in industry and society goes hand in hand with a major increase in the qualification requirements of the work force. Individuals with low level or no vocational qualifications who already face the most difficult problems on the labour market today will probably have a small chance of finding stable and promising employment in future.

The future development of employment amongst those with intermediate qualifications, i. e. people who have completed initial in-school or in-plant training is assessed differently in some cases. All forecasters do, however, stress that on this level considerable substitution processes are to be expected and that these qualifications are viewed as problematic unless they are made more attractive. Parity of esteem between practical and theoretical education and training can best be achieved in the employment system in respect of income, adequate employment, career prospects and further training opportunities.

5 New occupations and qualification requirements

New occupations and employment fields are often seen as the solutions to labour market crisis. The fascination exercised by the "new" which suggests an increase in employment and thus a reduction of unemployment is understandable. As far as I can see, however, researchers in this area are somewhat more reticent. I will limit myself to mentioning only a few aspects of this complex subject.

First, a distinction should be made between "new" fields of employment which create additional jobs on the one hand, and "new" occupations which differ in their contents, profiles and requirements to a major degree from "old" occupations. A further important criterion for assessment is

whether these new jobs and occupations offer a viable future and satisfactory employment conditions, and are commensurate with the qualifications, i.e. whether we are dealing here with "good or bad jobs".

- When evaluating new areas of employment, consideration should be given above all to their additionality. If in some employment sectors existing jobs are reduced by new ones, the net employment effect may be relatively low. One example for substitution of this kind is the field of media and communication technology. The emergence of new media occupations (for instance media operator, media designer, commercial occupations in audio-visual media production, multimedia experts, etc.) and the dissemination of information and communication technologies can lead to classical occupations (typesetters, graphic artists, designers, media technicians, etc.) gradually being crowded out. Further examples can be found in the outsourcing of corporate functions (in particular company-related services).

  New areas of employment may also be created through statutory, institutional or fiscal regulations, for instance in the field of environmental protection (e.g. in emission control, waste disposal) or in safety at work, through the setting up of new public authorities and control bodies. Tax relief for specific services (for instance housekeeping) can lead to existing non-gainful forms of employment in the informal economy being professionalised, and non-registered activities in the shadow economy being legalised. In all these cases, however, attention should also be given to the economic and fiscal effects which tax relief or new control bodies have and how these affect employment in other sectors.

  Many new jobs are related to the creation or generation of new or shifting needs amongst final consumers (for instance in the media sector, consumer/fashion articles, tourism/leisure time) which induce corresponding increases in demand, investment and employment in the upstream production areas. These employment effects are calculated in the usual econometric models.

  Furthermore, we are also dealing with qualitative changes in products, manufacturing processes, new forms of work organisation, logistics, etc. which may also have employment effects, albeit not always positive ones. For instance, rationalisation investments, advances in repair simplification and in the shelf-life of products, the flattening of hierarchies linked to lean production and management may lead to employment losses for specific qualification groups.

- The second area, changes in occupational profiles and skill requirements, which may occur in shrinking employment fields as well, is closely linked to education and training. In this context several distinctions must be made depending on

  - whether we are dealing with ongoing changes in an occupational profile, such as the enlargement or enrichment of job tasks. Examples of this can be found in almost all occupations, e.g. in those which use new information and communication technologies or in which integrative work is performed by means of new organisation concepts. They include production-related services which are outsourced by companies to independent units. Activities of this kind call, in addition to specific professional knowledge, for all the skills which are required to run an independent company;

  - whether these are occupations which "merely" call for specialisation in the form of further training. These are mostly occupations with a narrow technical or commercial-administrative range of tasks. Occupations of this kind, which are tailored to a specific company, the requirements of which constantly change in line with the arrival of new technologies, should not necessarily be the subject of initial training but rather of further or continuing vocational training.

  - Furthermore, it should be examined whether these are new occupations which emerge complementarily to existing ones. Examples can be found in the field of non-medical care which, given socio-demographic developments (ageing of the population, higher life expectancy, etc.), lead to new areas of application. They are closely connected to the classical occupational areas of medical and social care. Here there may really be additional employment effects.

  - Finally, completely new occupational profiles may develop for which so far there has not been any formal training but at best informal or further training at the workplace. Occupations of this kind go hand in hand with the emergence and spread of social, economic and technological changes and the new application opportunities which they lead to. Examples can be found in the field of new media and communication industries, in environmental protection and in the leisure time and tourism sectors.

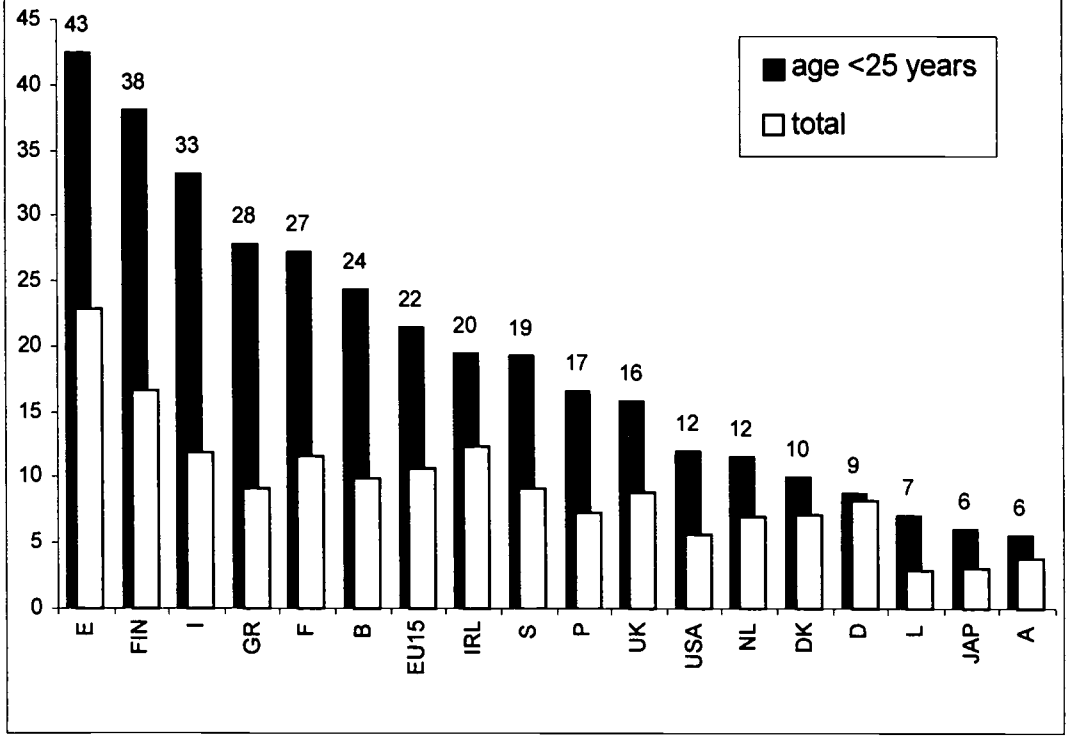
The main problem involved in identifying new occupations lies in differentiating between the new, the old and the intermediate. There are various ways of identifying them empirically. For example, we may conduct detailed analyses of those vacant positions, in which the description of the occupation and activities do not correspond to the traditional occupational descriptions and classifications. Another instrument is empirical surveys of the work force and companies which, given the unreliability of random sampling, calls for extensive and expensive screening procedures and/or large-scale random sampling. Finally, analyses of in-plant further training activities, which are oriented towards day-to-day practice and changing tasks, may offer insight into the development of new occupational and requirement profiles.

6 Problems in the transition from training to working life

One area which can be touched on only briefly here concerns the problems involved in the transition from training to the labour market. Although, in almost every Member State of the EU, research has addressed transitional problems for a long time and although numerous measures have been taken to ease this transition process, the situation has scarcely improved. This becomes obvious when we compare the unemployment rates for younger members of the working population under 25 years of age with the overall unemployment rate in the EU Member States (*Figure 2*).

I would like to comment on one of the diverse aspects of this problem which has been repeatedly touched on, particularly at the 1995 workshop of the network "Transitions in Youth" of the European Science Foundation (1995).

Figure 2: Youth and total unemployment rates[1] in Europe, USA and Japan 1995 (%)



[1] yearly average (unemployed as % of labour force)
Source: Eurostat 1996

This is a paradox. On the one hand, it has been observed in most European and non-European countries that education and qualifications are closely linked to success on the labour market. A higher level of qualification correlates significantly with lower unemployment rates, higher wages and better career opportunities. On the other hand, although young people are better qualified than any preceding generation, their transitional problems have worsened. I cannot resolve this paradox entirely, but I do think that there are several contributory factors. Thus, specific problems arise when the cohorts of the baby boom years enter the labour market in a period of economic recession and high unemployment. The theories mentioned at the beginning: segmentation, insider-outsider and, possibly, the mismatch theory, can partly explain this phenomenon.

When there is such an unfavourable constellation of a high number of young people who have successfully completed training, and restricted demand for labour - as has frequently been the case in the last 20 years - they enter into competition with at least three groups of people:

- Firstly, they compete with the numerous well-qualified persons in their own age group (intragenerative competition);

- Secondly, they compete with older skilled workers who have the advantage of more work experience and who, in periods of economic recession, leave companies in crisis and look for more attractive and stable employment (intergenerative competition).

- And thirdly, newcomers enter into competition with persons who were previously unemployed and who have obtained relatively up-to-date and practical knowledge by attending publicly financed further training or re-training measures.

Compared with the last two groups, newcomers who have completed training may have the advantage of broad and flexible knowledge and may demand lower wages. On the other hand, however, they are disadvantaged because of their lack of job experience and practical skills, a characteristic which serves as an important indicator for employers when assessing productivity. An additional problem may arise in cases where training was not "oriented towards the market" and thus leads to a mismatch between qualifications and job profiles. In-plant or practical training offers some advantages since the trainees have been known to

the company for a longer period and, hence, are viewed as insiders. One important consequence would, therefore, be to take steps to increase in-plant and practical training or to take measures in order to give graduates access to job experience and company contacts.

This raises a fundamental question about the goals and functions of education and training. Should education and training be oriented towards current success on the labour market and to improving the direct transition to the work process or should education and training aim at skills which may improve the longer-term employment prospects?

What is behind this is the hypothesis of a "trade-off" between broad, transferable skills which cannot be immediately utilised in the company on the one hand, and practical and company-specific training on the other. Whereas in the longer term the former certainly offers better employment possibilities, more protection against unemployment and greater flexibility in respect of future change and new requirements, specific training may ease the direct process of access to the labour market albeit possibly at the expense of longer-term employment prospects. In my view, discussion should be intensified on how the competition between goals of this kind can be softened by combining the provision of broad and transferable skills with practical training.

7 Summary and Conclusions

- Research results based on the New Theory of Endogenous Growth as well as on the Economics of Education confirm on the whole the positive benefit/cost relation and the significant contribution of education and training to economic growth. Since employment growth is mainly dependent on production and productivity increase, in the shorter run employment can only be expanded by higher investments in real capital and supporting economic policies. In the longer run, however, only those enterprises will survive structural change which are innovative, productive, and are staffed by highly skilled workers. As a result, qualification and skills are important location factors for European economies and yield significant benefits. Although education and training investments are not expected to increase employment substantially in the short run, they are essential for mastering structural change and increased competition on the world markets.

- Unemployment cannot *automatically* be reduced by economic and employment growth. In most European countries structural unemployment is persisting, mainly due to a mismatch in the profiles of qualifications and job requirements. Hysteretic unemployment due to the obsolescence of qualification and the existence of segmented labour markets for skilled and lower skilled manpower are further reasons for the persistence of structural unemployment. Thus, retraining and further training measures are increasingly necessary for matching the profiles of unemployed and jobs in the shorter and medium run. In view of the long-term structural change, not only the skill level is to increase, but also the profiles of skills should be adapted in order to ensure mobility, transferability and their adequate use.

- Structural forecasts for NL, UK, IRL and D expect an ongoing shift towards service sectors and towards white collar occupations. Qualification becomes increasingly important in the course of the structural change of economies. This results in higher skill requirements and thus in an increase of the demand for highly qualified manpower. Employment of lower skilled or unskilled workers is expected to decline dramatically in all four countries. To what extent this applies to intermediate education and training levels, too, is controversial. This becomes a crucial question for the attractiveness of vocational education and training (VET) which can be ensured on the one hand by reforming contents and curricula according to the need for broader, transferable and productive skills and, on the other hand, by a realisation of parity of esteem - above all within employment.

- When analysing new occupational and employment fields, a distinction should be made between employment growth in new fields and new occupational profiles. What new occupations really are, with all their implications for VET policy and curricular reforms, should also be analysed thoroughly. Many "new" occupational fields are but specialisations of existing profiles or subject to a specific further training. There is a substantial need for increasing research and development activities in the field of identifying new occupations and employment opportunities and their implications for VET systems.

- Research on the transition of youth into working life faces a paradox: On the one hand, education and training are considered to be the best protection against unemployment and to ensure stable and well-paid jobs. On the other hand, newcomers leaving VET increasingly face transition problems, although they are better qualified than the generations before. This paradox can in part be explained by labour market theories. Graduates compete - above all in a constellation of high demographic pressure and economic recession - with job seekers who have the advantage of longer work experience and practical skills, thus being considered as more productive. The crucial question for VET policy is: Should qualifications and skills be more specific in order to facilitate the transition process into working life or should they be broader and transferable in order to ensure future employment and mobility in the course of structural change? This trade-off between productivity (in the short term) and mobility (in the longer term) is controversially disputed. Possible measures could be training schemes which combine practical and in-plant training with broad and flexible training modules.

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Annex: The contribution of Education to Economic Growth: Selected research results

author	country	period	measure for education	conclusions: does education explain growth?
Alesina et al. 1992	98 countries	1950-1982	enrolment rates in primary and secondary schools	positive impact only of enrolment rates into primary schools, for secondary schools no significant contribution to growth
Amable 1993	59 countries	1960-1985	enrolment rates	positive impact both of primary and secondary enrolment
Barro 1991	98 resp. 88 countries	1960-1985 1970-1985	enrolment rates in primary and secondary education; student-teacher ratios, literacy	human capital reduces fertility and is correlated with physical investment to GDP; impact of literacy is not significant
Baumol, Blackman, Wolff 1991	111 countries	1960-1985	enrolment rates in primary and secondary schools	positive impact mainly of secondary school enrolment
Bradford de Long, Summers 1991	25 and 61 countries	1960-1985	enrolment rates	No or only small impact; the key factor is physical equipment
Blomström, Lipsey, Zeijan 1992	107 countries	1970-1985	enrolment rates in secondary schools	impact of secondary school enrolment is significantly positive
Cohen 1992	89 countries / 24 countries	1960-1985	enrolment rates	positive impact, but education is partially endogenous, low education trap is possible
Denison 1985	USA	1929-1982	length of schooling	positive impact: 26% of productivity growth is due to more education
Engen, Skinner 1992	107 countries	1970-1985	Literacy, enrolment rates in secondary schools	literacy and secondary school enrolment have positive effects on growth
Graff 1995	75 countries	1965-1985	educational level of labour force; literacy; enrolment rates	except literacy, enrolment rates and educational level of the labour force significantly explain economic development (together with accumulation of physical capital and technical progress)

Jorgenson, Fraumeni 1992	USA	1948-1986		investment in human and non-human capital accounts for a high proportion of the growth of US economy; educationa investment will continue to predominate in the investment requirements for more rapid growth
Levine, Renelt 1992	104 countries	1960-1989	enrolment rates in secondary schools	positive and robust correlation between average GDP-growth rates and secondary school enrolment rates: up to 17% of economic growth in developing countries and up to 9% in advanced economies is accountable to education
Lichtenberg 1992	53 countries	1960-1985	enrolment rates in secondary schools	significant positive coefficients of elasticity between enrolments and economic growth
Mankiw, Romer, Weill 1992	89 countries / 24 countries	1960-1985	enrolment in primary & secondary schools	positive impact: elasticity around 0,3 for secondary school enrolment
Otani, Villanueva 1990	55 countries	1970-1985	educational expenditure in % of public expenditure	positive correlation between educational expenditure and economic growth
Wolff, Gittleman 1993	111 countries	1960-1988	enrolment rates in primary and secondary schools	positive impact only of primary school enrolment; complementarities between investment and skills

Returns to vocational education and training (cited in Cooper & Leybrand 1996):

Bennett, Glennerster, Nevison 1992: In the *UK*, apart from the highest tier of vocational qualifications (e.g. BEC/TEC Higher Cer vocational qualifications yield lower returns (measured as lifetime earnings) than academic qualifications (O levels and CSE's).

Makepeace, Johnson (1995): An analysis of the Youth Training Scheme in the *UK* proves, that the returns to government training combin work experience or private sector training were significantly higher than the returns to government training alone.

McMahon 1988: In *France*, returns to secondary vocational and secondary general education are calculated by 7.6% and 10.1% respectively.

Elias, Hernaes, Baker 1994: In *Norway*, the returns to vocational school secondary education are weaker than returns to general educa comparison, apprenticeship schemes in the *UK* yield significantly higher returns.

OECD Activities Related to Research on Vocational Education and Training

Abrar Hasan

First of all, I would like to thank the organisers for inviting me to this seminar with the Management Board of CEDEFOP. Meetings like this underscore the importance of the close co-operation between the OECD and the CEDEFOP in the area of vocational education and training. In listening to the presentation by Mr. Tessaring, it becomes clear that there is much common ground between the work of the two organisations and it would be extremely advantageous for them to maintain close co-operation as well as develop it further.

My remarks will be divided into four parts:

- Where does VOTEC work fit into OECD's broader mandate in the area of education and training work?
- A review of OECD's work in the VOTEC area completed in recent years;
- Policy issues that have emerged from this work and the research gaps they identify; and
- Outline the work the OECD is now planning in this area.

Since the purpose of the seminar is to identify the research gaps, let me state at the very outset the main areas of focus as I see them:

A. What are the costs and returns to VOTEC? Despite the research undertaken in recent years, the costs and returns to VOTEC remain a neglected area.

B. Pathways: recent OECD research has identified the "pathways" as a useful approach to understand the importance of VOTEC. The concept needs to be invested with empirical information -- when do the pathways provide career progression, when do they land in dead-ends?

C. A key gap in knowledge consists of the changing demand patterns for skills and how it is differentiated between large and small and medium-sized firms.

D. There is widespread agreement that vocational learning must be brought together with the academic and the general. What mix of the theoretical-applied and vocational educational is most suitable for meeting the needs of the learner as well as the economy and what pedagogies are useful to deliver such learning?

E. There is a wide spectrum of institutional and market arrangements for providing VOTEC. What structures are most suitable for providing the mix noted in item iv)?

F. The VOTEC area brings together educational and business interests. What is the best way for involving business partnership in VOTEC?

G. Research findings from VOTEC have not found their way into practical application. There is an emerging need for accumulating new information and ensuring that they are disseminated to policy-makers, actors and stakeholders.

H. How much of VOTEC should be left to the market and what role should public policy play in this area?

1 VOTEC and Lifelong Learning

The context is set by the meeting of OECD education ministers held in January 1996 which gave the main lines for the mandate of OECD's work in the education and training area for the next five years (1997-2001). This mandate is summed up in Lifelong Learning for All (1996).

The concept of Lifelong Learning for All has been around since the early 1970s but has evolved with new directions. It is no longer restricted to the concept of recurrent education. Rather, it represents a new balance between the traditional missions of education and training -- personal development; social cultural and democratic advancement -- and the economic imperatives of the labour market set in train by globalisation, technological and demographic change. The credible route for OECD countries is a move to high-skill high value-added jobs.

The recent International Adult Literacy Survey (IALS) carried out by the OECD reveals that OECD countries have a considerable distance to go in achieving the target of a flexible and skilled labour force (OECD/Statistics Canada(1995)). Up to 25 per cent of OECD labour force is performing at low levels of an expanded measure of literacy and numeracy which falls well short of the requirements of a flexible and adaptable labour force. The high incidence of jobs turnover, the shrinking shelf-life of skills and the rising proportion of adults in the population makes re-learning on a continuing basis increasingly more important.

The concept of lifelong learning for all provides a wide-ranging framework and the target can only be achieved progressively over a long period. The immediate future, ministers of education set the following priorities:

- strengthen foundations for lifelong learning;
- facilitate transitions between learning and work;

and three cross-cutting areas:

- mobilising new resources for lifelong learning;
- developing new partnerships in the provision of lifelong learning;
- developing the required knowledge-base.

The framework set out above provides a new perspective for considering vocational and technical education (VOTEC). Does VOTEC, as presently constituted, serve the objectives of Lifelong Learning? If not, how should it be re-organised?

2 Recent OECD Work on VOTEC

In 1990, the OECD launched a four-year research programme in VOTEC, consisting of:

- an analytical framework for examining VOTEC;
- country reports outlining existing state of affairs, practices and policies;
- conferences to bring together experts from Member countries to discuss country practices and policies;
- a concluding high-level conference to bring together the findings and policy conclusions; and
- publications to disseminate VOTEC findings and policy conclusions.

The analytical framework was developed through the work concluded for four conferences and was presented at the concluding conference held in November 1994. Five publications reporting on the VOTEC work have appeared and are cited in the reference.

The first in the series of conferences was held in Phoenix, Arizona with the main focus on the linkages between general education and VOTEC. The conference introduced the concept of "pathways" and "integrated learning", concepts which were further explored at succeeding conferences.

The principal issues examined by the conference included: (i) the articulation of vocational education and training and other sectors of education; (ii) the pedagogical implications of closer links between theoretical and practical learning, work-based learning and the role of industry; and (iii) the role of coherent national policies in the VOTEC area, particularly across different policy jurisdictions.

The conference proceedings were published in "Vocational Education and Training for Youth: Towards Coherent Policy and Practice".

The second conference, held in Switzerland in September 1991, discussed pedagogical and organisational implications for VOTEC.

The issues considered included: (i) examples of school-industry co-operation in designing, implementing and updating VOTEC; (ii) the need for stronger foundations in basic knowledge for VOTEC; (iii) the issue of responsiveness to changes in skill requirements and how the co-operation between the firms and schools can be improved; and (iv) how to keep the teaching face abreast of new technologies and capable of bringing theory and practical application closer together.

The conference noted several tensions: the difficulty of taking out material that is no longer relevant from curricula; the problems encountered in expanding the school-based component; the sharp differences between the requirements of large employers and other enterprises; the delays encountered in carrying out consultations among all the actors involved versus the need for quick responsiveness.

The third conference, held in Porto, October 1992, focused on the theme of assessment, certification and recognition of skills and competencies. Certification lies at the interface between the behaviour and decisions of individual enterprises, private and public bodies and institutions and the individual learner.

The issues included the question of visibility, portability and marketability of skills and competencies and the role public authorities and the social partners need to play. For employers, there is a conflict between their short-term needs, when specific skills are needed on demand, and their long-term needs for high-skilled, high quality and flexible labour force.

The conference proceedings were published under the title "Assessing and Certifying Occupational Skills and Competencies in Vocational Education and Training".

The fourth conference in the series was held in Marseille in April 1994. It focused on the future of dualisation and "alternance" in the practice of VOTEC in OECD countries. The increasing importance of the linkage between education and the economy makes this a key issue. "Alternance" takes very different forms in different Member countries: traditional apprenticeships, the formal dual system, and vocational education in schools with shorter or longer periods of work experience. The appropriate intermingling of school-based and work-based learning is an open question, as is the question of appropriate pedagogical approaches for the desired combinations of school and work-based learning.

The proceedings from this conference were published in "Apprenticeship: Which Way Forward?"

These findings were brought together in a high-level conference held in Paris in November 1994.

In addition to a synthesis report the conference examined four issues: (i) how to improve the attractiveness of VOTEC - the parity of esteem issue; (ii) how to encourage progression in VOTEC; (iii) what is the investment role of VOTEC; and (iv) how to strengthen the VOTEC knowledge-base.

The proceedings from this concluding conference will be published under the title: "Vocational Education and Training for the 21st Century - Opening Pathways and Strengthening Professionalism".

3 Main Policy Issues

The work sketched above has examined a number of problems faced by VOTEC. More than any other education sector VOTEC is faced with conflicting demands:

- the sector requires sound academic foundations while at the same time promoting experience in practical application;
- prepare for work but also for continuing learning;

- the planning and delivery of education and training services is complicated by the presence of joint stakeholders, including schools and the private sector;
- look after the relatively disadvantaged yet must set high educational standards for their achievements;
- at the public level, the policy responsibility is shared between different government authorities.

In addition, the context for VOTEC is changing rapidly. Skill renewal is now needed on a continuing basis, and the value of old skills is changing more rapidly than previously. As new skills emerge, more frequently the question of relevance, quality and value of existing provision emerge more poignantly. The demand for low skills has fallen and employers are increasingly dissatisfied with the output of the VOTEC system. There are several strains on VOTEC: there is declining enrolment in initial VOTEC in most countries; there are increasing imbalances in the supply of and demand for training places; there is an increase in the numbers of apprentices not completing their contracts; an increase in the drop-out ratios from school-based systems in some countries; and there is an increase in the numbers following academic programmes who eventually end up in VOTEC after failing to gain admission to academic institutions.

The main policy issues that have emerged from the recent OECD work may be summarised as follows:

First, the question of the appropriate relationship between general and vocational education. There is a general consensus that the two, which have often been kept in separate compartments, need to come together, though not integrated. They need to come together because one of the new skills most in demand is problem-solving, which, in turn, requires the mastery of both theoretical knowledge and its practical application.

Likewise, the emphasis on key competencies - communication and social skills, computing and technical capacities - could inform both theoretical and vocational learning. Students learn better when theoretical knowledge is supplemented with hands-on experience. Finally, general, liberal, critical education is central to democratic societies and should form part of all education. The key question then arises about the appropriate mix of the vocational and general components and the kinds of pedagogy and institutional structures that are most suitable for the purpose.

Second, the issue of flexibility is pathways. Is the desire for higher education compromising interest in lower-level vocational education? Should countries continue to provide apprenticeships, but facilitate access to higher education for the apprentices, even though this may mean malallocation of resources? Should VOTEC be developed to attract able students by providing a career ladder?

Third, related to the second point is the issue of party of esteem between vocational and academic streams. This is the central question for English-speaking Member countries. It is clear that the status of vocational education could not be elevated swiftly though cosmetic changes or governments efforts directed at missing enrolments. The fundamental factor is how vocational education is valued in society and by the labour market. Whatever efforts are devised, they must be underpinned by the social partners.

Further, there is the issue of assessment and certification; there is the need to give value to what is obtained. The key question here is the extent to which it can be left to the market or underpinned by a social consensus. How to resolve the trade-offs between clarity and consistency on the one hand the need for frequent updating of skills on the other.

Fifth, the issue of "modularity" versus stability. A modular approach offers the advantage of rapid changes and in meeting specific demands of employers. The approach conflicts with the need for coherent and well-defined competencies, which are stable but slow to change. It is clear that the needs of Member countries vary considerably -- the Anglo-Saxon countries would likely benefit from increased modularization.

Sixth, the issue of paying for VOTEC: how to ensure that those who benefit -- enterprises, individuals, the general taxpayer -- share the burden of financing. At the enterprise level, efforts to set up accounting practices to reflect company expenditure and assets of human capital have not proven very successful. There is also the question of even-handed treatment by public authorities in dealing with VOTEC and higher education.

Finally, there is the issue of appropriate incentive structures that would encourage individuals to undertake appropriate amounts of VOTEC, and for enterprises to get the skills they need. It is clear that governments' roles cannot simply be restricted to the provision of appropriate

information to all the actors. Governments have to act in order to ensure that VOTEC participants have the required returns for their investment and that pathways are open that allow also access to future learning.

These issues should be assessed in the background of two overriding factors. Member countries differ in institutions, practices and social values and expectations. There can often be very large so that an approach which is suitable in one country may not be quite relevant for another country.

Secondly, the complexity of issues are such that a system-wide approach is required. The research so far has been largely of a partial nature. As a result, policy-making for VOTEC usually takes place in isolation from policy formulation for the labour market. There is a fragmented approach to policy-making for VOTEC. The educationist content themselves with the organisation of teaching, curricula, and methods of instruction. A second group consisting of institutionalists focuses on a politico-institutionalist approach. A third group, made up of economists, focuses on the incentive structures facing individuals and the enterprise.

What has not been adequately recognised is that VOTEC is closely tied to the labour market, company decision-making, the industrial relations systems and social values. A systemwide approach is needed because individuals face a changing and complex choice set of pathways and intertwined training and VOTEC.

4 New Work

Following the four-year work on VOTEC the current emphasis in OECD is on linking this work to the broader work on the labour market and on lifelong learning. In this context, I will describe some of the ongoing and new work that are most closely linked to VOTEC.

I have already mentioned the work on Lifelong Learning. The publication Lifelong Learning For All presents a state-of-the art picture on this topic. The work on Flexible Enterprise examines the changing nature of work organisation and its implications for human resource practices. It focuses especially on employers' need for training and the incidence and distribution of training opportunities. New work, following on this, will focus on guidelines for non-financial reporting by firm on human

resources. This work is part of the work on Measurement of Human Capital Investment, which has been commissioned by the OECD Ministerial council.

The most direct follow up is in the activity on the thematic review of Transition from Initial Schooling to Working Life. This work focuses on the process of transition and takes the age group 15-29 as the reference point. The whole age-cohort will be examined, not only those who are early school leavers or have particularly poor unemployment experience. The study brings together the education and the labour market perspectives and then addresses the policy co-ordination issue raised above.

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Research on Vocational Education and Training in Europe

Papers from the seminar organised by CEDEFOP

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The links between education and training on the one hand, and work, economic growth and new technologies on the other were subject of a seminar organized by CEDEFOP in November 1996.

Although the contribution of education and training to economic growth and productivity is widely confirmed by research results, numerous questions remain open. They concern the nature of skills needed, problems of unemployment and of the transition of young people into working life, the emergence of new jobs, and the role of education and training policies.

The papers presented at the seminar discussed some recent research work carried out in these fields and give an overview of on-going activities. The conclusions drawn indicate that a single policy is not expected to substantially increase economic growth and employment, and to decrease unemployment. What is more, a policy-mix and a package of strategies is necessary to achieve these goals.

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