

Identifying skill needs for the future

**From research
to policy and practice**

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From research to policy and practice

Susanne Liane Schmidt,
Olga Strietska-Illina,
Manfred Tessaring,
Bernd Dworschak (eds.)

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The **European Centre for the Development of Vocational Training** (Cedefop) is the European Union's reference Centre for vocational education and training.

We provide information on and analyses of vocational education and training systems, policies, research and practice.

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Europe 123
GR-570 01 Thessaloniki (Pylea)

Postal address: PO Box 22427
GR-551 02 Thessaloniki

Tel. (30) 23 10 49 01 11, Fax (30) 23 10 49 00 20

E-mail: info@cedefop.eu.int

Homepage: www.cedefop.eu.int

Interactive website: www.trainingvillage.gr

Edited by: **Cedefop**
Manfred Tessaring, *Head of area*
Project manager

Published under the responsibility of:
Johan van Rens, *Director*
Stavros Stavrou, *Deputy Director*

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Note from editors

The issue of early identification of skill needs is becoming increasingly challenging but ever more important. Technological change and innovation demand new skills and competences in the labour market. Some qualifications are becoming obsolete but emerging new skills and competences require specific education and training. The availability of reliable and accurate information on skill trends allows policy-makers and practitioners to respond promptly to new and changing requirements. This publication identifies challenges and offers solutions in early identification of skill needs; it also discusses the findings, their relevance and transfer to policy and practice.

The publication is based on proceedings of the international conference 'Early identification of skill needs' organised during the Greek Presidency in May 2003 in Thessaloniki. The conference brought together policy-makers, social partners, practitioners and researchers from 24 countries of Europe and beyond. The conference participants discussed experiences and examples of good practice in identifying, anticipating and monitoring changing and newly emerging national, sectoral and regional skill needs. Examples of skill need identification for specific target groups were also discussed. The conference helped to promote cooperation among countries and to transfer results into policy and practice.

The conference also helped establish an international network for exchange of information and knowledge on the subject. Participants unanimously expressed their support for creating an information platform and underlined the necessity for joint actions in research, analysis and policy, sharing expertise and experience throughout the European Union and beyond. The European Centre for the Development of Vocational Training (Cedefop) responded to the demands and subsequently launched the Skillsnet network (www.trainingvillage.gr, look under Projects and Networks).

We would like to express our acknowledgements to all those who helped in making this important event possible: the German Federal Ministry of Education and Research (BMBF) and the Greek social partners (LAEK – Employment and Vocational Training Fund) who cofinanced this event and supported Cedefop in the conference organisation and in promoting the exchange, networking and transfer of results on early identification initiatives in Europe.

The conference in Thessaloniki was a logical continuation of activities started by the first workshop of experts, which took place in Berlin in May 2002, jointly organised by BMBF, the Fraunhofer Institute for Industrial Engineering (Fraunhofer IAO), the Social Science Research Center Berlin (WZB) and Cedefop. The proceedings of the 2002 workshop published by Cedefop (English version, Reference series, No 40) and the Fraunhofer IAO (German version, FreQueNz series Vol. 9) can be obtained from these organisations. Please note that in the meantime a network on early identification of skill needs (Skillsnet) has been established at Cedefop's European Training Village (www.trainingvillage.gr/etv/Projects_Networks/Skillsnet/).

We hope that this new publication in the series will be a step forward in increasing transparency and sharing expertise in early identification of skill needs. We wish to see, however, many more such steps helping researchers, policy-makers and practitioners to grasp the future with less uncertainty and to respond to its demands accordingly.

*Susanne Liane Schmidt
Olga Strietska-Illina
Manfred Tessaring
Bernd Dworschak*

PART I

Welcome and opening
of the international conference
Early identification
of skill needs in Europe

Contributions in Part I

Johan van Rens
Cedefop Director

Ioanna Panopoulou
Secretary General, Ministry of Labour
and Social Affairs, Greece

Sergio Corti
European Commission,
DG Education and Culture

Christoph Ehrenberg
Director General, Federal Ministry
of Education and Research, Germany

Heikki Suomalainen
Union of Industrial and Employers'
Confederations of Europe

Johan van Rens

*Director, European Centre for the Development
of Vocational Training (Cedefop)*

I would like to welcome you to this conference on the early identification of skill needs in Europe, taking place during the Greek Presidency.

In particular I welcome the representatives of national ministries and parliaments, the European Parliament, the European Commission and the European Social Partners.

I also welcome the numerous participants from EU countries and particularly from the new accession countries. Experts have come from as far as Canada and India to join in our discussions. We have representatives from 24 countries, which demonstrates the great interest in the issues on our agenda today and tomorrow.

Last but not least, I should mention that this conference has been organised jointly by Cedefop and the German Federal Ministry for Education and Research, the Fraunhofer Institute for Industrial Engineering and the Social Science Research Center Berlin and is cofinanced by the Greek social partners.

The rapidly changing social, economic and demographic environments in which our education and training systems operate underscore the importance of the issue on our agenda. New skill needs are emerging while traditional skills are changing their focus and profile. This is a great challenge, not only for those using such skills, but also for policy and decision-makers at all levels.

Identifying skill needs is about detecting, anticipating and monitoring new and changing skills needed in future labour markets. This applies not only to company needs but also to individuals, particularly those at risk, e.g. low-skilled people, the long-term unemployed, immigrants, etc.

Numerous activities have been developed in European countries within the past decade, based on a variety of approaches, and looking at several levels – national, regional, local, sectoral and occupational. This variety reflects the diversity of European education and training systems and respective research and calls for targeted approaches.

However, the future is unpredictable, and we have to live with uncertainties. The shaping of education and training takes time, and young people will use what they have learned in a future society about which we know little.

How can policy design education and training in accordance with the future requirements, and what tools and approaches have been developed by research to support policy-makers in this effort? And how can this initiative contribute to realising the ambitious target set at the Lisbon Summit in 2000, namely that the European Union should become the most competitive and dynamic knowledge-based society in the world?

These are crucial questions. If we leave this conference with a greater awareness of the opportunities for, but also of the limitations in, identifying future skill needs and an indication of how to transfer these findings into policy and practice, the conference will have been a success.

It will have been even more successful if we agree to establish closer cooperation and networking, both within the research world and between research, policy and practice.

A concern common to all these initiatives is how to make the results useful for policy making, and how to organise this policy transfer. In my view, policy transfer requires the participation of all decision-makers in those initiatives from the start and a continuous involvement of policy-makers and all stakeholders throughout the process.

The activities we will be discussing are not ephemeral but call for a sustained and longer-term effort in which suitable approaches have to be developed and applied, constructive discussions with all stakeholders have to take place, and where pros and cons have to be discussed in depth. Problems are similar throughout Europe, and mutual learning should be reinforced/fostered by exchange of information and best practices.

An exchange of information and of researchers and experts across countries, e.g. within certain projects, would allow participants to learn from others and provide their experience to others. These exchange activities could be organised via an electronic platform, supported by, for example, a virtual and physical community to which all stakeholders in this field belong and contribute.

Cedefop is prepared to promote research activities and cooperation and to support the exchange of both information and experts across countries. A particular focus will certainly be the support to the new Member States and the accession countries in the near future.

Although a vast number of research and policy networks already exist, we strongly believe that a network dealing with an 'early warning system' for new and changing skill needs is very important and would gain widespread acceptance. The German network 'FreQueNz' (www.frequenz.net) has achieved this goal already. Cedefop could contribute to, or even establish, a similar European and international network by providing its infrastructure in

terms of technical and human resources.

Cedefop will also be able to use its various channels to inform national and European stakeholders, to invite them to participate in exchange and networking activities and actively support the transfer of results into policy.

A broad dissemination of results can be ensured by our electronic media. These are the European Training Village (ETV – www.trainingvillage.gr), the Cedefop homepage (www.cedefop.eu.int), the Cedefop Research Arena, European Research Overview (Cedra/ERO) and Cedefop documentation (all within the ETV). Dissemination should also be promoted by our print media, particularly our Reference and Panorama series, the European Journal and Cedefop Info. Furthermore, knowledge resulting from this initiative will be added to our knowledge management system (KMS) which is being set up at the moment and will be made available to all those interested.

I wish us all a fruitful discussion and exchange of ideas in the course of this conference and a valuable future cooperation to the benefit of all: researchers, policy-makers and, in particular, all those affected by the challenges our societies are facing.

Ioanna Panopoulou

*Secretary General, Ministry of Labour
and Social Affairs, Greece*

We in Europe share the future within a community of values.

Europe is now pursuing a strategy aimed at making it the world's most competitive economy. This strategy relies primarily on a knowledge-based economy, combined with sustainable development, full employment and social cohesion.

Achieving this goal requires the enthusiasm and commitment of all Europeans.

In a changing world, our dedication to unchanging values will ensure that our ambition is not utopian and that the strategy does not remain just a vision.

We believe that modernising the European Social Model must be a priority for Europe. Recognising the social dimension of the United Europe will enshrine the European Social Model within the new European Constitution.

A few years ago, the European Council in Lisbon decided that changes in the global economy required adaptation in order to safeguard the European social *acquis*.

A year ago the European Council in Copenhagen took the decision to enlarge the European Union.

On 16 April in Athens, at the foothills of the Acropolis, the President of the European Council and the leaders of the 10 acceding countries signed the Accession Treaty and were welcomed into the now 25-strong European Union, thus enriching Europe in political, cultural, economic, social and historical terms.

This historic step leads to the development of a democratic Union of sovereign States, which, despite national and cultural differences, share common policies, common values and common aims.

The informal Council of Employment and Social Affairs Ministers, held in Nafplio, reaffirmed Europe's staunch commitment to the Lisbon Strategy, as it has developed over this period. Discussions focused on establishing priorities for the review of the European Strategy for Employment on the basis of:

- (a) the Barcelona Conclusions;
- (b) the evaluation of the European Strategy to date;
- (c) the enlargement of the European Union;

- (d) current economic and political developments in Europe and internationally (economic slump, recession).

The Presidency Conclusions pointed out objectives for employment as threefold:

- (a) full employment (more jobs);
- (b) quality and productivity (better jobs);
- (c) labour markets promoting social inclusion and integration (a cohesive society).

The Council of Ministers in Brussels reached the same conclusions. It has, therefore, been decided to simplify employment guidelines and ensure greater synergy and coordination between social and economic policies.

Promoting employment and combating unemployment, achieving a balance between flexibility and security, is a major challenge for us in Europe. It is accepted that education and training can be catalysts in working towards the strategic aim of turning the EU into the most competitive and dynamic knowledge-based economy and society, characterised by full employment and social cohesion.

We should clarify the new roles and responsibilities of both the Member States and the new members and candidate countries, as well as that of the European Commission. We should identify the main factors leading to the achievement of these targets and redefine our priorities concerning investment in human resources.

Over recent years, the scope of the term 'capital' in development theories has expanded. In traditional neo-classical theory the term 'capital' refers exclusively to natural capital (money, infrastructure and equipment). Today's theories, however, focus on human capital and emphasise its importance through the advancement of knowledge and skills of both the labour force and the non-active population.

Away from theoretical approaches, the value of investing in people is recognised as its effectiveness can be empirically demonstrated:

- (a) for the economy, as it indirectly promotes growth;
- (b) for citizens: qualified workers earn higher pay, integrate more easily into the labour market and have better career development prospects. In other words, investing in people leads not only to more jobs, but also to better jobs;
- (c) for businesses: employees who can adapt to the knowledge-based economy improve company profitability and competitiveness.

Nor should we forget that quality and productivity are a central issue.

Globalisation and technological progress are changing both market structure and work organisation. The implementation of the European

Employment Strategy resulted in the creation of 12 million new jobs between 1995 and 2000. During the same period, jobs in the new technology sectors increased by 2.2 %, and jobs in information society-related services rose by 2.9 %. The services sector has been responsible for 20 % of all new jobs since 1995. Around 30 % of employees in this sector are highly qualified. Since 1996, the ratio of unskilled to skilled workers has fallen significantly.

We should bear in mind that:

- (a) around half of those working in Europe today use a computer at work. This figure is constantly on the increase;
- (b) access to the Internet has increased rapidly. Already, one third of the EU population can access the information and new knowledge available on the Internet;
- (c) the use of constantly developing, and frequently innovative, technological applications is the new reality.

At the same time, however, gaps are widening:

- (a) the number of new high-skill jobs compared to jobs requiring low qualification levels is 3:1;
- (b) high-income individuals are three times as likely to have access to the Internet than individuals on low incomes;
- (c) less than 5 % of the elderly use the Internet;
- (d) women continue to have less Internet access than men.

It is clear that the knowledge and information society does not only offer new opportunities. It also creates new disparities and new forms of exclusion by widening the gap between rich and poor. It is of vital importance that we intervene to ensure equal allocation of the benefits of the information society to all citizens of the European Union.

Knowledge, and participation in the information society, will increasingly serve to distinguish between the educated and the 'illiterate'.

Employment and social cohesion policies cannot succeed if the efforts of the Union to promote a knowledge-based society fail.

The transition to a knowledge-based economy can contribute to economic growth, create more and better jobs and provide greater opportunities. But it also entails a challenge: how can we avoid creating greater disparities? A key role will be played by lifelong learning in Europe and by maximising investments in human capital during all stages of the economic cycle and working life.

We need a labour force with a high general level of education, that is, a labour force armed with knowledge that is in line with the needs and prospects of the economy and society.

Today in the EU, 40 % of the unemployed have not completed secondary level education. To assist these people, we must offer them appropriate

training, upgrade their literacy and numeracy abilities and improve their social skills.

Moreover, in the EU on average just 8 % of individuals aged 25-64 participate in education or training. Those who would benefit most from learning are often the ones with the fewest opportunities to participate in it. To remedy this situation we need to offer flexible, attractive and high-quality learning opportunities for all. We also need cohesive, mutually supportive education and training systems that are able to respond to the changing needs of the labour market. Greater emphasis must be placed on new forms of training, such as training at work (more specifically alternate training and employment).

In Europe, our policies for investment in people suffer from basic problems. So far, we have failed to make it clear that public expenditure on human resources will bring about significant benefits to the economy; but it is imperative that we do so if we are to create a new mentality. In the short term, such policies entail costs but in the long term they lay the groundwork for greater productivity and competitiveness.

There is an extremely low level of private sector investment (primarily from companies) in overall expenditure aimed at making good use of human resources. This shows that the business world has taken scant interest in investing in human resources. The degree of private investment in the European Social Fund's five policy fields – active employment policies, social cohesion, lifelong learning, adaptability of the labour force and women's participation – stands on average at 5.4 % of the total for the 2000-06 period.

Meanwhile, in negotiations for collective agreements or contracts, the social partners have given little or no attention to the issue of continuing training and improving knowledge.

We know that the ESF share in the overall Structural Funds budget during the programming period 1994-99 was 30 % (compared to 52 % for the European Regional Development Fund) out of a total expenditure of EUR 156 000 million for the four funds (ERDF, ESF, EAGGF, FIFG).

This share has remained approximately the same for the 2000-06 period. There are two reasons why investments in human resources are low in all sectors of the economy:

- (a) such investments have no instant economic impact;
- (b) to date, such investments have not been very effective as they had not been linked to wider development-oriented investments at European, national and local level. This is due to the overly cumbersome organisation and operation of the ESF and the lack of coordination between all funds. The lack of proper planning is also to blame.

The Lisbon Council identified a series of policy sectors on which human resource development policy can usefully focus. These include:

- (a) combating digital illiteracy;
- (b) the increase in educational monitoring for the entire population (fewer dropouts at the level of compulsory education, greater opportunities for participation in compulsory education and access to further education such as second chance schools, etc.);
- (c) the development of lifelong learning systems which can adapt to the labour market's needs.

Achieving the Lisbon targets requires coordinated activity by all parties involved: citizens, enterprises, social partners, public authorities and local government. A few days ago, in a speech to the European Forum on Local Development and Employment, organised by the Ministry of Labour and Social Affairs in the context of the Greek Presidency, Commissioner Anna Diamantopoulou spoke of 'intelligent cities', that is, cities that know how to plan, select and define their own development.

However, 'intelligent cities' require 'intelligent systems' and 'intelligent people'; and intelligent people require the weapons that education and training arm them with.

We need policies that extend to the entire working life of an individual, providing for numerous switches between training and employment. It is already well known that during our active professional life each of us may be required to change profession approximately four times, a figure which is on the increase. Work-based training must also be extended to make lifelong learning a reality. In addition, it will help workers stay in employment or achieve greater job mobility.

Bearing the above in mind, we should particularly aim to:

- (a) develop informal training that is linked to the company's new investments;
- (b) train older employees so that they can remain active for longer;
- (c) train the unskilled labour force so that they can be employed productively by the company, but also so that workers themselves can obtain more qualifications and thus improve their lot;
- (d) establish additional incentives for employers to develop employee training schemes, such as tax breaks, special awards, financing for training that is linked to the development of new business sectors;
- (e) achieve synergy between initial and continuing education and training.

We need programmes for the unemployed that are geared to improving knowledge. It is now a shared belief that the development of lifelong education and training contributes significantly to employability not only by

adding knowledge and developing occupational competence but also by improving social skills. The individual learns to develop critical and creative thinking, links personal experience with the new knowledge acquired, learns to cooperate, bolsters his or her self-confidence and becomes capable of taking a more active and creative role in all issues of personal interest. In short, the individual becomes an active citizen.

We need, however, to address the following critical issues:

- (a) certifying non-formal training;
- (b) extending the right to compulsory education, allowing free access for all citizens, regardless of age;
- (c) improving the initial education system so that it is more directly linked to labour market needs;
- (d) ability to evaluate knowledge and skills regardless of where such skills were acquired; employment agencies should be able to include all skills in shaping accurate occupational profiles and make more effective links between individuals and employment opportunities (Education and training account);
- (e) emphasis on programmes for the disabled so that the policy targets of equal opportunities, eliminating discrimination and social inclusion do not remain on paper only;
- (f) greater participation of vulnerable social groups in training;
- (g) better opportunities for employment for women via training.

The way in which public employment services operate is of particular importance in this: they need to meet the challenge of linking labour market supply to demand .

In Greece, under the third Community Support Framework, training programmes were announced and financed on the basis of research findings on enterprise personnel needs.

A new survey is now being carried out by the OAED's (Greek Manpower Employment Organisation) subsidiary company National Employment Observatory Research - Informatics SA. This is conceived as a tool for the early identification of knowledge and skill needs necessary for the Greek labour market and for the economic and social development we seek.

It is of major importance today for the enlarged EU and for each separate Member State to examine again the level of investment and the quality of public investments, to make the best use of research and development of human resources and achieve the Lisbon Targets.

We need to find the right balance between various forms of investment to reorient ourselves toward a knowledge-based society. At the same time, we must ensure economic and social restructuring.

The Structural Funds, especially the ESF, have a definitive role to play in this reorientation through the use of social capital. The EUR 60 000 million for the 2000-06 period will be the main factor in developing human capital to meet the needs of the New Economy. In 2000-06, at least EUR 12 000 million from the European Social Fund (a figure corresponding to 8-40 % of the total budget of Member States) will relate to lifelong learning. The ESF's EQUAL Community Initiative is trying out new ways of dealing with inequalities in the labour market. Lifelong learning is one of its eight priorities, for which the Member States have made available the second largest budgeted amount.

We need to strive for a multiplier effect of these investments:

- (a) by reducing bureaucratic structures and achieving more flexible and more effective financing schemes for investments in human capital, by limiting time-consuming procedures, by differentiating ESF procedures from those of the ERDF;
- (b) by introducing measures to improve the quality of education and training provided;
- (c) by promoting flexibility in redefining the allocation of resources, based on evaluating results and needs;
- (d) by linking ESF resources with development investments and with the other Structural Funds;
- (e) by collaboration and coordination, to highlight those sectors where more knowledge is necessary within a society based on development and cohesion;
- (f) by creating sustainable systems for investment in human capital and adapting these investments to the special features of each country and each region.

Related proposals should be addressed to the mid-term review of the ESF and other Structural Funds, which will deal not only with current beneficiaries but also those now joining the EU. European organisations such as Cedefop can, and should, play a special role in making Europe a knowledge-based economy and society, the most competitive such society on the planet.

It is vital to realise that people, enterprises, regions and countries failing to invest sufficiently in human capital place their economic prospects in jeopardy. Our target should be to invest in sustainable economic growth, employment and social cohesion, particularly in a context of change. That is why governments, businesses, citizens, the social partners, and the European Commission need to make more efforts. A policy focused on this objective will require several kinds of action:

- (a) governments need to define a framework of qualitative parameters for employers and citizens, aimed at improving the quality of public and

- private sector investments in human capital;
- (b) the European Commission and all European institutions ought to place such policies among their priorities;
- (c) local authorities should review public expenditure and propose investments that combine the best use of human resources with meeting local needs and developing the area;
- (d) social partners should actively participate in promoting lifelong learning, by making it a criterion as vital as the viability and economic development of enterprises;
- (e) citizens should become involved and help develop a culture of lifelong learning by demonstrating its added value. Citizens should also participate actively in the decision-making process and in shaping policies that affect them directly.

A healthy, well-trained and flexible labour force is at the core of economic success in a global economy and the main element in achieving full employment and social cohesion. To quote a Chinese proverb: 'When planning for one year, sow wheat. When planning for 10 years, plant trees. When planning for life, train people.' (Guanzi, circa 645 BC).

Reality changes either gradually or rapidly and every moment focused on the present resembles an obsession with the past.

It is our duty to create a sense of security for European citizens faced with the inevitable changes.

We all need to agree on the priorities:

- (a) the right to full-time, creative employment with knowledge levels enabling people to work, combined with equal access to top level health and education services;
- (b) the right to quality in the workplace;
- (c) the right to live in a satisfactory natural and social environment;
- (d) the right to equal opportunities in an unequal world;
- (e) quality of life;
- (f) leisure time.

All of us need:

- (a) the serenity to accept what we cannot change;
- (b) the courage to change what we can;
- (c) the wisdom to tell the difference;
- (d) decisiveness and common effort to achieve our aims.

As the ancient Greek writers said, *'οι καιροί ου μένεται'*, in other words, 'time waits for no man'.

Sergio Corti

European Commission,

Directorate-General for Education and Culture

Education and vocational training are crucial to achieving the strategic goal set at the Lisbon European Council to make the European Union, by 2010, the most competitive and dynamic knowledge-based economy, and society, in the world.

The heads of State and Government, meeting in a sequence of spring European Councils after Lisbon, confirmed the role and importance of education and training and set priorities for concerted European action.

A detailed work programme on concrete objectives for education and training systems has been adopted. In doing this, the Education Council and the Commission underlined that making the European Union the leading knowledge-based economy in the world would be possible only if education and training functioned as factors of economic growth, research and innovation, competitiveness, sustainable employment, social inclusion and active citizenship.

The Commission communication on lifelong learning, by putting lifelong learning strategies as the overarching driving principles for education and training policies, has relaunched the debate and established a number of building blocks in areas where action is particularly needed.

The first of these highlights a 'partnership approach': all relevant actors and stakeholders inside and outside the formal systems must collaborate.

The use of indicators, existing, under development or to be developed, and implementation by networks are also important elements.

The role of the social partners will never be sufficiently emphasised. European level social partners have acted positively by agreeing in early 2002 to *A framework of actions for the lifelong development of competences and qualifications*. In that document the first priority for action is to 'identify and anticipate the competences and the qualifications needed', indicating two priority levels at which such identification should take place: the enterprise level and the national/sectoral level.

This is the political background that highlights the importance and relevance of the topic of early identification of skill needs which is at the heart of economic development and to which education and training can greatly contribute.

The identification of skills must be tackled with a bottom-up approach, involving all relevant players in education, training and learning landscape, and in the economy in general.

This approach cannot be centralised and restricted to instruments and mechanisms, although tools and instruments are necessary.

Identification, intended as prediction, cannot stand alone. It has to interact with policies relating to skills development, targeting all relevant levels.

Further, I am not sure that 'skills' is the best concept, if taken as a stand alone. It has to be associated with the concepts of qualifications on a formal level and of competences both at formal and non-formal levels. In fact, sometimes there may be a lack (or surplus) of qualifications without necessarily having in parallel a lack (or surplus) of competences.

Finally, there is the need to develop the concept of inclusion. The involvement of all relevant players can be further developed on five levels: individuals, enterprises, sectors, Member States and Europe. These are detailed below.

It is crucial to enable individuals to appreciate and overview their own skills, competences and qualifications. It is also crucial to support them in making their competences visible and help them understand and clarify their strengths and weaknesses.

In terms of policies it is important to follow consistently a lifelong learning approach: valuing learning through transparency, through effective guidance, but also through the support of human resources management in enterprises.

It is important, perhaps essential, for enterprises to perform competence audit exercises. Future needs will be emphasised by knowing the whole spectrum of competences existing at any given moment within the enterprise itself.

Promoting a learning perspective in enterprises, developing learning-conducive organisations, requires the identification of current skills and prediction of future needs.

Specific measures for enterprises should be developed, particularly for SMEs. The Framework agreement between the social partners could be the basis for this.

Developments at sector and branch level allow for better observation of specific markets and technologies, hence a more detailed knowledge of skill needs.

The Copenhagen declaration on Enhanced European cooperation in vocational education and training, signed last November by 30 ministers, the Commission and the social partners, highlights the importance of systematic support to branches and sectors in the development of competences and qualifications.

An important element is their ability to detect skills needs, and changes in these needs.

National qualification frameworks must be opened up to a situation of increasing change, thus making it possible for systems to identify and respond to new qualifications and competence needs.

Effective lifelong learning policies are central to this, especially in reducing the rigidity of such systems.

Work towards modularisation of vocational education and training provisions, to develop a credit transfer system specific to VET, is much needed.

Much work is needed also in order to progress towards validation of non-formal learning.

National systems must balance the sectoral approach by ensuring transversal elements, thus avoiding a bias towards too specific and short term skills priorities.

At European level it is necessary to ensure that the principles of lifelong and lifewide learning become a reality. This includes ensuring the link between the different actors: individual, enterprise, sector, national and European.

In conclusion, identification of skills, qualifications and competence needs, must be a task carried out in a decentralised manner, yet retaining the characteristics of being a shared responsibility at all levels.

It must be an exercise embedded in a lifelong learning perspective and strong links have to be maintained between identification and policies.

Christoph Ehrenberg

*Director General, Federal Ministry of Education and Research (BMBF),
Department of Higher Education and Continuing Training, Germany*

The 21st century brings changes which will dramatically alter the face of Europe. The expansion of the EU and the meshing of European trade – reinforced by the introduction of the euro – demand consistently forward-looking and stabilising policies. Increased cooperation has given European educational policy vast momentum. Joint educational programmes, improved transparency, mutual recognition of qualifications and increased mobility create preconditions for a transnational European educational area. Although each Member State remains fully responsible for its own educational system, a gradual rapprochement is taking place, which will enable us to master our common challenge.

Since the European Council set the goal of making the EU the most competitive and dynamic knowledge-based economic area in the world by 2010, we have to pool our efforts still further. Europe's education and training systems must focus more strongly on the needs of the knowledge society and guarantee a high quality standard. Adapting the European economy to international trends also demands new skills and qualifications. Therefore the early identification of changing skill needs in Europe is essential. Pursuing this objective requires individual European nations to enter into intensive exchange and refrain from going solo. The Federal Ministry of Education and Research warmly welcomes this focus on the early identification of skill needs.

It gives us:

- (a) a chance to launch joint initiatives to promote, and continually upgrade, vocational education and training;
- (b) a chance for Germany to benefit from the experience of other countries.

Economic and technological developments, demographic trends and the mounting need for constant modernisation of vocational training measures require us to consider how to identify skill and qualification needs as early as possible. In 1999 the German Federal Ministry of Education and Research launched an initiative targeting precisely this area. Since then we have gathered an extensive collection of findings. Some of these will be presented later.

The first aim of the initiative is to use a careful analysis of changes in the labour market to develop needs-oriented vocational training measures.

The second is to introduce mechanisms which allow individuals independently to select appropriate training, by considering the emerging skill trends and comparing their own skill profiles.

The third objective is to ensure that this information is available to training providers so that they can devise learning objectives covering forecast long-term skill needs. The combination of the early identification of skill and qualification needs and the development of needs-oriented training measures boosts international competitiveness from a macroeconomic perspective.

Compiling reliable data on current and future skill needs is also vital for developing vocational training and higher education structures. This will help us make the best use of financial resources for education and training. Given the public funding crisis in Germany and the need for qualified employees, early insights into how better to allocate resources has key significance.

Only with a well-trained workforce can we remain innovative and competitive and thus guarantee existing jobs and create new ones.

To achieve our goals we need continually to modernise vocational education and training so that it nurtures the employability and adaptability of workers and promotes lifelong learning. In recent years Germany has taken great strides in this direction. Since 1996, 47 new training ordinances have been passed and a total of 125 vocational training profiles have been updated. So far 42 % of all trainees have embarked on training in a newly structured profession. To intensify and accelerate the modernisation of initial vocational education and training we will update a further 40 training professions by the end of 2004. We will need the early identification initiative findings to assist us. In addition, we must identify skill needs in continuing education and training, and upgrade continuing training courses by introducing new examination regulations.

Higher education establishments should pursue the new policy of opening their doors to people with vocational qualifications, especially in view of Germany's lack of qualified specialists. We are, therefore, currently trying to make transfer to universities easier and to have vocational achievements credited. We are developing a method of points and certification based on existing systems such as the European Credit Transfer System (ECTS). Following consultation with higher education institutes, we have agreed on a procedure which should make it easier for them to recognise vocational training and continuing training qualifications, as well as work experience for enrolment. We also plan to extend the range of courses, currently existing only as pilot projects, which take into account given qualifications and work experience. Judicious early identification of skills will assist the development of appropriate study programmes.

We also feel that early identification has an important role to play in the European debate on improving quality. Our initiative for more transparency and higher standards in continuing vocational education and training has prompted important first steps towards improving the situation. Only after we have identified current and future skill needs can we activate and test the 'modernity' criterion, for example, as a quality standard.

The early identification of skill needs is a prerequisite for shaping sustainable vocational training and higher education strategies. The German early identification initiative dovetails with our aims of continually modernising programmes, encouraging lifelong learning, promoting the transferability of vocational training to higher education and assuring quality.

In view of this, it is particularly important to look beyond our own borders and intensify the international exchange of methods and findings. By working together we can be more efficient. The Federal Ministry of Education and Research is ready and willing to enter into dialogue with the various players and sees this conference as a catalyst for a European initiative on the early identification of trends regarding skills and qualifications.

Heikki Suomalainen

*Union of Industrial and Employers' Confederations
of Europe (UNICE)*

Early identification of skill needs is a very important and far reaching issue. Industry and business know well how important it is to have a highly skilled work force to assist in developing companies.

The demographic development of almost all Member States in the European Union is such that future generations are smaller than those now in working life. The numbers entering the labour market will diminish; the shortage of skilled labour is already a fact in some branches in many countries and, it is looming almost everywhere. For instance, in Finland the number of people leaving the labour market is 70 000 per year while the number of people entering is only 50 000, a difference of 20 000 per year. In the near future there will be a labour force shortage, especially of skilled labour.

The effects of this demographic development on the structure of the labour market must be taken into account when anticipating future skill needs.

Another factor is the extremely rapid development of technology. It does not hit only new branches of industry which are using new technologies but also traditional industries. This means a great need for skills renewal, particularly of those in their most productive age.

We have seen the new industry take shape through the 1980s and 1990s and, although it is facing some temporary difficulties, in the near future it will affect all working life and create new jobs and new ways of working. The changes taking place in working life do not concern only specific professions but influence all kinds of industries throughout the European Union.

The social partners started to discuss education and training policy matters in October 2000 in the framework of social dialogue. They decided to take a new approach of looking for solutions to the new challenges of working life. The aim was to avoid a purely theoretical discussion. The approach was to look first at the challenges of the 21st century and then draw conclusions. It became quite clear that this was a fruitful approach and that one of the first challenges of today and tomorrow was the identification and anticipation of competences.

The discussions between the social partners at European level were concluded in March 2002 in the form of the framework of actions adopted by

all relevant confederations in March 2002 and presented to the European Council summit in Barcelona.

In the framework, the social partners agreed to draft a yearly follow-up report, and in February 2003 the first report was ready. The annual report contained different national or sectoral actions taken by social partners and also examples of identification and anticipation of skills needs.

Without going deeply into details one can conclude that national social partners have paid much attention to the issue. Some general trends can be seen emerging from the national reports.

First, social partners in some cases have decided to draft reports and studies on the economic and labour market situations and prospects in the country/sector concerned.

In several countries they paid particular attention to supporting the SME efforts to identify competence and qualification needs.

The social partners also took measures designed to develop the competences of certain categories of workers, so that they can maintain and develop their employability, or to help companies and organisations put in place competence management policies and evaluate their impact.

There are also actions designed to match training offers with the needs of companies and the labour market, particularly at branch or territorial levels.

European and national social partners are very keen to stress the importance of identification and anticipation of the competences needed in working life as these actions show.

PART II

Activities in early identification of skill needs in Europe, policy relevance and future needs

Contributions in Part II

George Psacharopoulos

Keynote:

Linking research, policy and practice

Susanne Liane Schmidt, Gudrun Steeger

**The FreQueNz initiative – a national network for
early identification of skill and qualification needs**

Christoph Hilbert, Klaus Schömann

**The need for early identification
of future skill requirements in the European Union**

Linking research, policy and practice

George Psacharopoulos

Member of the Hellenic Parliament, Greece

The effort to identify future training needs has a history of at least 50 years. During this period, a variety of models have been used with more failure than success. The contribution draws on lessons from the international experience in forecasting training needs since the 1960s, discusses recent research findings in the economics of training and possible training paths for an enlarged Europe. It covers the links between formal school and training, the labour market, and financing skills acquisition in a lifelong context.

1. Historical perspective

The post-World War II era has been characterised by intensive economic planning. Both industrial and developing countries aimed to increase investment in physical capital to ensure a given rate of economic growth. The methodological link between investment and economic growth was the so-called 'capital-output' ratio, i.e. a coefficient denoting the necessary amount of capital per unit of output.

In the early 1960s the concept of the physical capital-output ratio was extended to include 'qualified' or 'high-level manpower', as it was called at the time, namely the necessary amount of scientists, engineers and the like needed to produce a unit of output in the various sectors of the economy (Table 1).

Manpower planning culminated in the OECD's Mediterranean project, a major exercise in several countries attempting to predict, over a period measured in decades, the skills necessary for achieving economic growth targets, (Parnes, 1962; OECD, 1965).

The International Labour Office (ILO) and the World Bank used the manpower forecasting model extensively to advise countries on the skills needed for economic development and to design education projects that would provide the necessary qualified labour (Psacharopoulos, 1991).

Table 1. **Typical manpower supply and demand table**
Training needs in country X

Occupation	1988 Manpower stock (supply)	2003 Manpower requirements (demand)	1988-2003 Training needs (demand minus supply)
Electrical engineer	10 000	12 000	2 000
Mechanical engineer	15 000	18 000	3 000
Foreman	20 000	24 000	4 000
Supervisor	15 000	16 000	1 000
Skilled worker	50 000	60 000	10 000
Middle-level technician	30 000	35 000	5 000
Etc.	—	—	—

While nearly every Ministry of Education and Labour across the world had a unit engaged in manpower forecasting, two parallel activities were taking place. First, at the Higher Education Research Unit at the London School of Economics a project was set up to evaluate the accuracy of manpower forecasting. The POMF, as it was known (Post Mortem of Manpower Forecasting) under the direction of Professor Mark Blaug resulted in a book published in 1973 that gave the *coup de grace* to manpower forecasting (Ahamad and Blaug, 1973). Among the many manpower forecasts that were mature by the time, comparing the plan to the actual situation demonstrated forecasting errors of thousands of percent, even for such occupations as teachers.

A second parallel activity concerned human capital and the economics of education. This originated at the University of Chicago with Theodore W. Schultz (1961) and Gary Becker (1964) at Columbia University, followed up by Mark Blaug (1970) and others at the London School of Economics and the University of Dijon in France. At the core of human capital theory is cost-benefit analysis applied to education and training. Early empirical applications showed that what many countries may need as a priority is primary education, rather than high level manpower typically dictated by the application of manpower forecasting (Psacharopoulos, 1994).

There are many reasons for the two models yielding diametrically opposite recommendations for educational policy, the main one being that manpower forecasting does not take into account the relative costs of providing different levels of qualified manpower. Also, the benefits aspect of manpower forecasting is given as numbers of people, rather than the relative

productivity of each individual. In addition, manpower forecasting does not take into account substitution possibilities between different kinds of skills, let alone substitution between capital and labour. It is a static model, completely disregarding dynamic changes in the economy, the driving force of economic growth.

As a result of the POMF project and similar accumulated evidence, by the late 1980s the World Bank and the ILO had stopped using manpower forecasting to recommend education and training policies in a given country. The lending profile of the World Bank has now changed to promote primary education, at the expense of university education and secondary vocational education (World Bank, 1991).

Given this short history, the hope is expressed that the theme of early identification of skill needs is not just another name for, or attempt to resuscitate, manpower forecasting.

2. Recent research findings

To a non-economist, the lessons from the above history may seem strange. Every country in the world needs doctors, teachers, plumbers, carpenters, priests and artists: the last two have been really included in the Mediterranean regional project. Why do we not attempt to forecast their numbers so that the universities produce the right amount of doctors and the vocational schools the right amount of carpenters?

The reason is research evidence showing that universities and vocational schools might not be a priority in several countries (Psacharopoulos, 1987). The figures given in Table 2 come from human capital literature. The economic rate of return on investment in education is inversely related to the level of education. Primary education should be a priority in countries where the coverage at this level is not universal; next comes secondary education and university. Note that application of the manpower forecasting model would have given exactly the opposite recommendation.

Within levels of education, contrary to any intuitive thought, general secondary education is more profitable than vocational education. The reason is that whereas general and vocational secondary school graduates have more or less equal earnings after graduation, the vocational track of secondary schools costs about twice that of the general track (Psacharopoulos and Loxley, 1985). It was this finding that made the World Bank change its lending profile as recently as 1991 away from secondary vocational schools, the main focus of its activity since its inception (World Bank, 1991).

Table 2. **Social returns on education by level and curriculum type**

Educational level/type	Rate of return (%)
Primary	18.9
Secondary	13.1
– General	15.5
– Vocational	10.6
Higher	10.8

NB: Figures are world averages

Source: Psacharopoulos and Patrinos (2004) Table 5, and Psacharopoulos (1994) Table 2

Beyond the formal school system, robust research indicates that retraining programmes for the unemployed are ineffective (Heckman et al., 1999). The costs of such programmes grossly exceed the benefits, the latter being measured by the length of time needed for a graduate of these programmes to find a job, and by the earnings differential of those who graduated from the programme relative to those who did not.

Recent research has also shown that employers want to hire workers who possess very general, rather than specific, skills (Table 3). General skills, as identified by Murnane and Levy (1996), make workers easily trainable for unforeseen occupations.

Table 3. **Worker characteristics sought by employers**

Basic reading ability
Basic arithmetic ability
Basic problem solving ability
Ability to work in groups
Ability to communicate
Basic computing ability

Source: based on Murnane and Levy (1996).

Another related research finding has to do with the importance of institutions. For example, unemployment might not be caused by the lack of skills: it may just reflect the fact that hiring labour is expensive. It is agreed today that instead of trying to identify training needs or provide retraining programmes for the unemployed, the role of the state is to maintain a healthy

macroeconomic environment conducive to growth. A typical example of how the state can act as an inhibitor, rather than as a catalyst, for employment promotion is in increasing the labour hiring cost to firms. In some countries, the labour cost to the employer is twice what the worker gets in wages; the rest being a tax on employment for often dubious social security benefits (Table 4). Also, labour protection against dismissal is four times as strict in Germany as in Ireland. Is it, then, a wonder why unemployment in Germany is higher than in Ireland?

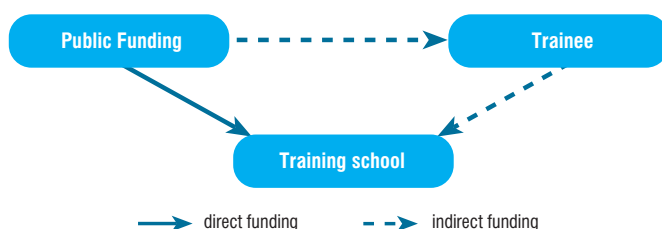
Table 4. **Labour protection measures**

Country	Wage share in labour cost (%)	Strictness against dismissal (index)
Germany	55	10
Spain	55	15
Ireland	71	3
United Kingdom	71	2

Source: OECD (1997), Tables 25 and 31.

Although the state could finance training, the delivery of training services could be provided more efficiently by private firms dedicated to vocational training (Figure 1). By giving the training money to the candidate trainee, the trainee can choose the school that would best fit his or her interests. Private training schools will depend on profits gained from fees paid by the students and so they will be competing with each other. The good ones will flourish, and the bad ones will close down. A Government-run training school is not likely to close down because of low quality. The indirect flow of funds can have significant redistributive power if a higher amount training voucher is given to poorer trainees.

Figure 1. **Direct versus indirect funding**



While manpower forecasting deals with the number of trained workers needed to achieve production targets, today's emphasis is on the quality of training. There are two ways of measuring this. First is the input method, i.e. the amount of resources spent per trainee. However, a high level of spending may indicate inefficiency, rather than higher quality (Hanushek, 1981). Hence the emphasis has shifted these days to the output method of measuring quality, i.e. the employment outcomes, measured by the time needed to find a job after training, and the earnings of trainees over a control group of non-trainees.

The establishment of a control group for evaluating training is essential but often completely disregarded by practitioners. There are two methods of establishing a control group. First is including in the employment outcome regression a host of independent variables by which trainees and non-trainees may differ. The second is random assignment of a group of potential trainees to the course that is under evaluation. Random assignment is the most valid construction for a control group. (Heckman and Hotz, 1989; Ashenfelter and Card, 1985; Ashenfelter, 1986; Ashenfelter and LaLonde, 1997).

3. Training paths for Europe

There seems a big gap between Europe and the United States regarding analytical work on training issues, and human capital in general (Psacharopoulos, 1999, 2000). The list of references in European literature on training includes mainly descriptive material that would not stand refereeing in the mainstream academic journals dealing with the issue (e.g., the *Journal of Human Resources*, *Labor Economics*, *Education Economics*, *the Economics of Education Review*). Most of the works cited are not found in the ECONLIT database. Nowhere are there references to James Heckman, who received the Nobel prize essentially for dealing with the selectivity problem, i.e. on how to establish a proper control group for evaluating training. There is no reference to the work of Nobel Laureate Gary Becker, who conceptualised the difference between general and specific training, and the implications of this distinction regarding the distribution of the training costs between the worker and the employer.

Instead, the European Union has embraced the concept of lifelong training, but without any analysis on the duration of this training, who will offer it, and, above all, who will finance it.

It is true that, by the Treaty of Rome, each country is responsible for its own education and training policy. In my opinion, however, the European

Union has missed the opportunity thus far to document in a rigorous way the true training gaps in member countries. It might be thought that general education is well developed in Europe, so what is at stake is specialised training. Yet several literacy studies have found that there is a surprising degree of functional illiteracy in some countries (OECD, 1998). In the United Kingdom, for example, one out of five adults could not locate a plumber in their city's yellow pages (Moser, 1999). At the same time, the rate of unemployment in European countries far exceeds that in North America or the Asian tigers.

Given this situation, attempts to identify skill needs might be an unproductive activity. The clue to the unemployment problem should first be sought in providing a macroeconomic environment conducive to growth. This means following a monetary and fiscal policy that would lower the cost of labour to the firm. Next is removing barriers to competition. Where large pockets of functional illiteracy exist, priority should be given to adult literacy programmes, rather than specialised vocational training.

Schools should teach, and make sure students master, the three R's ⁽¹⁾, before being channelled into welding or carpentry. Schools should teach communication and social skills above any courses leading to specific occupations. Specialised training could be provided in dedicated vocational schools, away from the Ministry of Education. And incentives should be given to firms for providing training on the job.

Most importantly, where possible, state education financing should be separated from the delivery of training services that could be provided more efficiently by private firms. Candidate trainees could be given a cheque for them to buy the kind of training they themselves feel they need, in a vocational school of their choice.

Lastly, training schemes should be evaluated. Privately provided training does not need to be evaluated: the very fact a private training school survives on the basis of student fees, means it offers what the trainees want. However, Government training programs should be evaluated in a rigorous way by establishing a control group and subjecting the employment outcomes to cost-benefit analysis.

The speed with which the European Union has addressed education and training issues thus far, and the recent enlargement of its members, does not provide encouragement that training issues will receive the analytical rigour they deserve in the near future.

(1) 'Reading, wRiting and aRithmetic'.

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The FreQueNz initiative – a national network for early identification of skill and qualification needs

Susanne Liane Schmidt

*Fraunhofer Institute for Industrial Engineering
(Fraunhofer IAO), Germany;*

Gudrun Steeger

Federal Ministry of Education and Research (BMBF), Germany

In 1999 the German Federal Ministry of Education and Research (BMBF) launched an Initiative for Early Identification of Qualification Needs. An essential element of this initiative is the FreQueNz research network (FreQueNz is an abbreviation of the German title for the Network for early identification of qualification needs), which is concerned with questions on skill trends. The emphasis is on the early identification of new skills and on assessing the significance of findings for vocational training. The network comprises 11 institutes and organisations working on projects with a mainly qualitative focus on specific sectors of activity, enterprises and target groups. Research activity is linked through the network, making it possible to retain an overview of the work and to discuss methods, approaches and results in progress. The network makes it easier for project partners and users to contact each other and thus to communicate, cooperate and disseminate results efficiently. The findings contribute to modernisation of vocational training and allow a prompt reaction to changes as they reveal themselves. The aim of the initiative is to recognise skill needs, make findings rapidly available and formulate options for action in initial and continuing training.

In parallel with these activities, it is intended to establish links between the FreQueNz network and a future European network on early identification of skill needs to conduct exchanges on methods, approaches and results with respective projects and institutions in other European countries. For this purpose Cedefop, the BMBF, the Fraunhofer IAO and the Social Science Research Center Berlin (WZB) organised the conference whose proceedings are published in the present publication.

1. Introduction

Vocational training policy is currently facing many challenges. How to avoid an imbalance of skills and skill shortages in the labour market? How can we cope with the growing importance of human capital in the knowledge society? How can vocational training courses best contribute to the principle of lifelong learning? All these have highlighted the need to update the regulations governing initial and continuing training and to define new occupations and skill profiles. Therefore, in 1999 the German government and the social partners in the Alliance for jobs, training and competitiveness (*Bündnis für Arbeit*) agreed to launch a skills offensive (*Qualifizierungsoffensive*) aiming, among other things, to devote a greater effort to the early identification of skill and qualification needs. This agreement laid the foundation for the Initiative for Early Identification of Qualification Needs of the German Federal Ministry of Education and Research (BMBF) involving the creation of a nation-wide network for cooperation among various research institutes and vocational training institutions and bodies. One of the tasks of this network is identifying future-oriented skill profiles and devising ways and means of establishing new occupational categories and bringing existing ones up to date. This is intended to contribute to modernising the vocational training system and hence to meeting the challenges outlined above.

The relevance of a networked system for early identification is apparent from the impending shortages of skilled labour currently facing Germany. To obviate this situation it will be necessary to ensure that enough young people are adequately equipped with skills for their future careers, while suitably upgrading the skills of older workers (Reinberg et al., No 9, 2003; Reinberg et al., No 2, 2003).

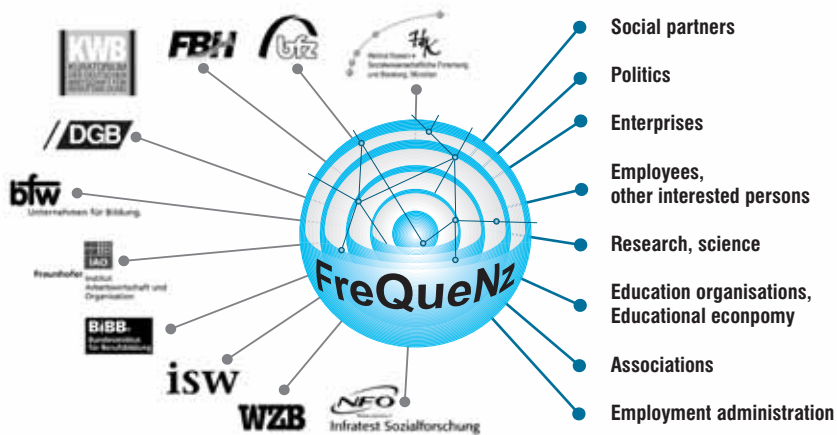
The projects on early identification of skill needs will make it possible to avoid imbalances between demand for, and supply of, qualifications and skills, and will ensure that skill profiles are in line with future demands. This is done by mainly qualitative research methods at sectoral, industry, enterprise and target group levels.

An advantage of networking is that it offers an overview of results generated by the different research approaches, which can then be channelled into vocational training policy discussion. Moreover, communication of transparent results to counselling and guidance organisations and interested individuals is able to influence skill-related decisions, and can contribute to reducing skill imbalances in the economy.

2. The FreQueNz research network: project partners, projects and objectives

The Federal Ministry of Education and Research (BMBF) sponsors a variety of projects with different objectives as outlined below. Individual project partners are linked together in the FreQueNz network, whose function is to combine and collate the results obtained and assist the Ministry in their dissemination. Results are made available to a wide range of target groups, which, besides educational organisations and enterprises, are chiefly the social partners and associations involved in vocational training policy deliberations as well as researchers and academics working in the field.

Figure 1. **The FreQueNz research network: project partners and users**



The following 11 institutions and organisations are now linked within the FreQueNz network:

- the Vocational Continuing Training Centres of the Bavarian Business Sector (bfz);
- the German Trade Union Confederation's Further Vocational Training Centre in Hamburg (bfw);
- the German Federal Institute for Vocational Training (BIBB);
- the German Trade Union Confederation's Federal committee for vocational training (DGB);
- the Research Institute for Vocational Education and Training in the Crafts Sector (FBH) at the University of Cologne;

- (f) the Fraunhofer Institute for Industrial Engineering (Fraunhofer IAO);
- (g) Infratest Social Research;
- (h) Helmut Kuwan, Social Research and Consultancy, Munich (HK-Forschung);
- (i) the Institute of Structural Policies and Economic Development (isw);
- (j) the German Employers' Organisation for Vocational Training (KWB);
- (k) the Social Science Research Center Berlin (WZB).

The main objectives of the German initiative for Early Identification of Qualification Needs are:

- (a) efficient monitoring of market changes to allow a more rapid response;
- (b) recommendations for action;
- (c) contribution to vocational training research.

Various appropriate actions have begun to take shape. At the start of the initiative the emphasis was on evolving, testing and evaluating a variety of methodological approaches to early identification of qualification needs. A number of conferences attended by all project partners were organised at this stage by the FreQueNz network, providing an occasion for information dissemination and discussion among interested academics and social partners about methods applied in the field. Now that the appropriate methods have been determined, work is under way to identify new skill and qualification needs in a wide variety of fields of activity and to disseminate the results to an interested (specialist) public.

Figure 2. **Objectives, activities and procedures**

Objective	Fields of Action	Approach
Anticipating changes of markets	Early identification at the intermediate skills level	• Supporting cooperation
Responding quickly to changes	Networking of current projects	• Transparency on current research activities
Developing recommendations for action	Public relations	• Feedback between reality of work, research and politics
Designing innovative educational research	Cooperation with political representatives in the field of education	• Compilation and publication of results

Meanwhile, studies of new skill needs have been conducted in a number of industries such as building and construction, motor vehicle, electronics, financial services, health and wellness, information and communications technology, metalworking, the retail trade and tourism, supplemented by work on 'hybrid' areas such as e-commerce, logistics, facility management, call centres and skill needs for the low-skilled. Cross-national comparisons have been made in a number of other areas to identify examples of best practice, and links established with the German vocational training reporting system, particularly the Vocational training report, the Skills structure report and the Continuing training reporting system (*Berufsbildungsbericht, Qualifikationsstrukturbericht, Berichtssystem Weiterbildung*).

3. Results from the research projects

The following is a description of some of the activities covered by the early identification initiative and their results. A number of projects are being conducted jointly by FreQueNz partners so that networking is already achieving an impact at individual project level.

3.1. Early identification of qualification needs for disadvantaged groups

The project undertaken by the Vocational Continuing Training Centres of the Bavarian Business Sector (bfz) is concerned with skill trends in low-skill occupations. The new requirements were identified using case studies of enterprises and surveys among experts in manufacturing and services. The trend is towards enriching and upgrading less skilled activities by giving those concerned more responsibility and independence and broadening the knowledge and know-how required for the work. It is increasingly the working environment, rather than the job itself, that influences individual skill requirements. Low-skilled workers are being asked more and more for personal, organisational and social skills over and above their technical knowledge, although these are not expected to reach the levels possessed by a skilled worker.

The information concerning current and future skill requirements for low-skill occupations, obtained from the analysis of interviews with experts and case studies, has been assembled in a competence matrix which shows the connection between types of work processes and the competences required. It also makes clear that the requirements for simpler jobs are very different from those for jobs at higher skill levels.

The next stage will be to produce a concept for an analytical instrument for use in enterprises, and enterprise-specific procedures for continuously monitoring skill needs.

3.2. Early identification projects of the German Federal Institute for Vocational Training (BIBB)

The projects being run by this organisation relate to three core areas described below.

3.2.1. Representative analyses of demand for skills and qualifications in the labour market

Process, product and organisational innovations made by enterprises affect the qualifications and skills they demand from their employees. The project aims to identify these new skill needs using several complementary approaches:

- (a) analysis of the advertisers' wishes as expressed in job advertisements;
- (b) follow-up interviews on the actual needs of these advertisers;
- (c) surveys of technological and organisational trends in enterprises and the related skill requirements.

The analysis of job advertisements is designed to identify new occupational areas and jobs. Job advertisements across all occupational fields are analysed and quantitatively assessed at regular intervals. In addition 10 % of the advertisements (chiefly those relating to new gainful activities) are recorded in their full text and subjected to qualitative analysis to obtain detailed information on tasks, activities and qualification requirements at occupational level. Representative analyses of job advertisements are carried out in selected fields, such as IT (Bott and Schade, 2003), financial services and health. The picture obtained by this method is, however, still inadequate, since it presents a hypothetical picture of the skills required (the advertisers' wishes). For this reason, after about six months have elapsed the advertisers are questioned with a view to obtaining additional information on the actual job involved, the person hired and the role played by certain qualifications and skills in the recruitment decision – that is, on real rather than ideal requirements. Enterprises are also asked about changes in skills. The aim is to identify changes in skill needs resulting from product, process and organisational innovations.

3.2.2. Trends and new offers in the continuing training market

New developments and new skill needs emerging at work are first addressed in vocational, or in-house continuing training structures. As a result of their focus on market requirements and their flexibility, these are the drivers for

many trends that are only taken up within the more regulated fields of vocational education and training at a much later stage. The Federal Institute for Vocational Training is currently pursuing three approaches to identifying skill trends that are complementary to one another:

- (a) structural and longitudinal section analyses in the KURS database provide information on changes and trends in available continuing training;
- (b) regular questionnaire surveys among continuing training providers (wbmonitor) yield information on the training offers, reactions to and changes in courses on offer together with training providers' experience and their assessment of trends;
- (c) an award for innovative continuing training is intended as a direct source of information on innovative continuing training and as an indicator of new trends and state-of-the-art training design.

3.2.3. *Tapping the expertise of consultants and attendants on corporate changes*

This project is designed to draw on the skill trend knowledge of external consultants and in-house experts at executive and management levels, research and development and personnel departments, and staff and workers councils. Aspects under study include how new skills come into being in enterprises, enterprises' skill needs, and in-service skill-building concepts, their implementation and approval. Data is gathered by interviewing external consultants and in-house experts using pre-prepared guidelines as well as through case studies of consultancy and follow-up of enterprise restructuring processes. These are prepared for, or supplemented by, written questionnaires sent out to enterprises under the BIBB's reference enterprise system (RBS).

3.3. **Life and work: qualification and counselling in dialogue**

The German Trade Union Confederation's (DGB's) *Leben und Arbeiten* (life and work) project is concerned with identifying skill trends in the metalworking, electrical/electronics, social work and health sectors. Findings are used in conjunction with the testing of practice-related, future-oriented coaching concepts for employees with low to medium-level qualifications and skills. The aim is to combine advice on matters of skill trends in enterprises with meeting continuing training requirements and to provide employees with advice on how to enhance their skills and careers.

This is achieved by ascertaining actual needs for skills and advice in selected areas of activity. Case studies focus on enterprises' new requirements for in-depth knowledge in selected areas. The objective is to

take into account individual needs, wishes and possibilities as well as the enterprise requirements. The case studies of enterprises are also used as the basis for producing a training coach job profile.

The project focuses on the following areas:

- (a) early identification of future skill needs in the metalworking and electrical/electronic industries and in social work and health;
- (b) ascertaining employee need for continuing training and support;
- (c) designing and implementing coaching/consultancy offers.

The DGB's Federal committee is running this project in conjunction with the Fraunhofer Institute for Industrial Engineering and its own vocational training centre (bfw) in Hamburg.

3.4. Permanent close-to-the-job observation of qualification needs aiming at an early identification of changes at the workplace and within enterprises (ADeBar)

The Fraunhofer Institute for Industrial Engineering and Infratest are currently working with HK-Forschung in the ADeBar project. The aim is to monitor working practices as a source of information concerning the trends in tasks and new skill needs in companies. The method used is a combination of qualitative and quantitative surveys.

Since 1999 investigations into skill trends have been carried out in logistics, e-commerce (Bullinger et al., 2003), facility management, ICT, the retail trade (Abicht et al., 2003), and commercial office work. Current studies relate to renewable energy sources and telecommunication-based services. The principal results regarding skill needs for commercial office work can be grouped under four headings:

- (a) administration involving routine documentation and filing tasks;
- (b) organisation involving coordination and mediation, plus constant communication;
- (c) financial work involving active costing and cost progress monitoring;
- (d) responsibility for providing technical, ergonomic and other assistance to office workers in the use of space and equipment.

According to the results obtained by a quantitative survey of 335 enterprises, the aspect most in demand is item (b).

3.5. Determining trend qualifications as a basis for early recognition of qualification developments

Having, in late 2002, completed its studies on emerging qualifications in the tourism, health (Abicht et al., 2001), financial services and the retail sectors (Abicht et al., 2003), the Institute for Structural Policy and Economic

Development (isw) began in early 2003 to look at the new subject of trend qualifications in security-related services and life sciences ⁽¹⁾.

The study of security-related services was confined to services provided by private enterprises. This is a growth industry with rising turnover. It was noticeable that work originally carried out by official bodies is increasingly being entrusted to private security enterprises. As a result, demand for service quality is becoming more stringent and generating new needs in terms of employee skills, particularly the ability to communicate, a capacity for organisation, quickness of reaction and the ability to maintain focus in every situation.

Studies in the life sciences sector centre on modern biotechnology, which experts assume will, as a basic industrial technology, decisively influence the industrial landscape as well as people's daily lives over the next few decades. Discussions with selected enterprises reveal that the existing skills and qualifications of middle-level personnel are falling short of needs. Shortcomings have been found in such areas as quality assurance, measuring and testing, the use of modern technical equipment, working with PCs and knowledge of specialist English.

3.6. Sector-specific information system for the skill development: making use of the business sector networks

Central to this project is the early identification of innovative market and business trends and the resultant need for skills. The facilities of the IDQ[®] system for regular monitoring of skill trends is used to access industrial expert networks and, through them, information and know-how of trade organisations, professional associations and enterprises, which is then combined and collated to serve as the basis for the early identification process. The information system has been further developed as the project has advanced, aimed at:

- (a) including more recent sectors of activity that do not yet have their own expert networks and association structures;
- (b) identifying shortages of skilled staff and ensuring that they are included in the continuous monitoring operation;
- (c) using Internet-based information systems for efficient data gathering.

So far the improved system has been used to study skills trends in the food industry. The work encompassed the baking, confectionery, butchery and meat products sectors and succeeded in identifying a total of 452 indicators

⁽¹⁾ Detailed descriptions of types of activity and emerging qualifications in life sciences and security services can be found in the individual sector reports under <http://www.frequenz.net>.

which experts considered relevant to the future design of initial and continuing training.

Further studies will relate to the chemical industry and to the more recently emerging sectors of automation and facility management/building systems.

The German Employers' Organisation for Vocational Training (KWB) is conducting this project in conjunction with the Research Institute for Vocational Education and Training in the Crafts Sector at the University of Cologne (FBH).

3.7. Qualification needs in the OECD countries: early recognition, analysis and implementation

Results of investigations in other industrialised EU and OECD member countries are an important source of information when analysing skill and qualification needs. An international comparison reveals parallel trends in other countries; it also allows us to identify and analyse, with regard to best practice, innovative solutions for improving the match between skill demand and availability in the labour market. The Social Science Research Center Berlin (WZB) is studying the methods used to forecast skill needs in selected OECD countries and their findings in order to avoid market failures and faulty allocation of resources.

These studies include a comparison between Germany and Denmark and an analysis of skill and qualification needs for Sweden.

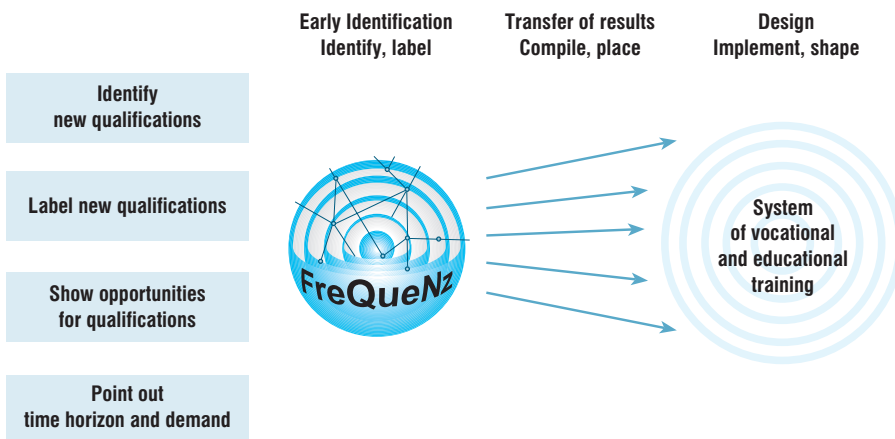
The German/Danish comparison shows that the proportion of Danish enterprises that analyse skill needs, and plan and implement continuing training, well exceeds that in Germany. Continuing training in more general aspects such as communication skills and motivation can be linked to changes in work organisation. The need for such skills regularly varies between enterprises of different size.

Recent analyses carried out in the case of Sweden forecast a varying future demand for graduate engineers, demand in child care and in health (nurses and doctors), in personal services and for various groups of teachers.

4. Disseminating results

The results so far have served, among other things, to stimulate discussion on the need to treat logistical aspects in commercial training and have also led to the creation of a working group charged with drawing up a specific further training profile for a wellness trainer. These two examples show that work in Germany on early identification of skill needs helps shape initial and further training for recognised occupations.

Figure 3. **Transmitting results to the initial and further training system**



The FreQueNz network has proved its value. A number of conferences have been organised and research results published in newsletters and in the 'Qualifikationen erkennen – Berufe gestalten' (Recognising skills – structuring occupations) series which now comprises 11 volumes. A website, www.frequenz.net, has also been created and will be used to make the results of individual research projects accessible to lend further impetus to dissemination. Since 2003, the German Federal Institute for Vocational Training has organised a discussion series reinforcing dialogue with the social partners on the results of the early identification initiative. The general objective of these measures is to make the project results and other information available to a wide range of users (social partners, associations, research bodies, the German Federal Institute for Vocational Training, enterprises and training bodies) as rapidly as possible to further the modernisation of vocational training.

5. Setting Germany's early identification initiative in a European context

In parallel to national activities, work on early identification of skill needs in Germany has been done from the outset in close contact with research partners in other countries. A Franco-German conference was held in 2001, followed by an international one in the premises of the Social Science Research Center Berlin (WZB) in 2002. The latter was the predecessor of the 2003 international conference in Thessaloniki, whose proceedings are published in the present publication.

Bringing the European economy into line with international trends involves new skill needs that affect national training provision. Viewing matters from a European standpoint strengthens regional and national efforts and allows comparison of qualifications and skills with those of other European countries. It is worth bearing in mind that the impetus for change in skill needs, and the skill mismatch challenge facing vocational training policy, are similar in all countries (Descy et al., 2001, pp. 14, 32-33). This supports the German intention to use its early identification initiative to support Cedefop's work at European level.

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The need for early identification of future skill requirements in the European Union

Christoph Hilbert, Klaus Schömann

Social Science Research Center Berlin (WZB), Germany

There is a widespread consensus that human capital is a key to individual employability and that lifelong learning constitutes an important precondition of macroeconomic growth. Therefore, enhancing human capital investment and lifelong learning are important tasks in education and labour market policies in a world subject to forces of globalisation. Assuming that information on future skill needs is the basis of efficient education and labour market policy, the WZB-project, as part of the German FreQueNz-Network, deals with analyses and forecasts of qualification needs and the subsequent implementation of policies from the perspective of an international comparison.

The article gives an overview of the project. The first part highlights major results of past work and the design for the future research. The second deals with the question of why we address skill needs and for whom our research is intended. We find evidence that, despite the huge differences in analysing future skill needs in Member States, the general importance of enhancing information about labour and skills markets is widely accepted. We observe a general north-south and a west-east differentiation, whereby northern and western EU-countries invest more effort in early identification and policies which target future skill needs.

1. Introduction

There is a consensus among researchers and politicians that human capital is the key for individual employability, either in independent or dependent employment status. Additionally, lifelong learning is an important precondition of macroeconomic growth in a world subject to forces of globalisation. Therefore, enhancing human capital investment and lifelong learning are

important tasks in education and labour market policies. Several European Union Member States have focused attention on the fact that high unemployment and skill shortages may occur simultaneously in some sectors or occupations. Public attention has been raised, with governments and interest groups including the social partners searching for solutions to these mismatches, although sizeable resources are already devoted to lifelong learning and active labour market policies. Reducing skill shortages is a vital part of European Union policy, particularly since the 2000 Lisbon European Council set the ambitious goal of making Europe the most competitive and dynamic knowledge-based economy in the world by the year 2010. Early identification of mismatches and skill needs, therefore, is central for the European Union and the OECD (Wilson, 2001; Neugart and Schömann, 2002).

Researchers almost unanimously agree the importance of a highly qualified labour force for macroeconomic growth and high individual earnings. However, little detailed knowledge is available on the necessary specification or occupational content of such human capital. Qualifications, specific professions and competences in short supply need to match the demand on the labour market. Profiles of competences have to follow the demand for specific products and services. Efforts in identifying skill needs differ greatly between countries according to their economic structure.

Some countries, like the USA and Canada, have a long tradition of extensive quantitative analyses; others show a more divergent and fragmented landscape of early identification of skill needs. Large countries are not the sole users of skill needs identification at regional level; regionalisation of education, lifelong learning and labour market policies have encouraged smaller economic clusters or regions to run their own future-oriented identification (Hilbert and Mytze, 2002).

Using cross-national comparison, the Social Science Research Center Berlin (WZB), which is part of the FreQueNz initiative, deals with analyses and forecasts of qualification needs as well as options for implementation of appropriate vocational education and training measures ⁽¹⁾. The aim is to provide decision makers at various levels with sound information on country-specific skill needs. Additionally, the project allows insights into the internationalisation or Europeanisation of the market for skills.

The following part highlights some results of our own WZB-project (Hilbert and Mytze, 2002; Neugart and Schömann, 2002). The third part deals with

⁽¹⁾ Like the other projects within the FreQueNz initiative, the WZB project 'Qualification needs in the OECD countries – early recognition, analysis and implementation' is sponsored by the German Federal Ministry of Education and Research (BMBF).

major political implications from these results. We ask why we should analyse future skill needs, who the potential users or beneficiaries of this work might be and how this influences the type and the presentation of results. The fourth part draws conclusions on the need for a European wide initiative of early identification of skill needs.

2. Qualification needs in OECD countries: major results

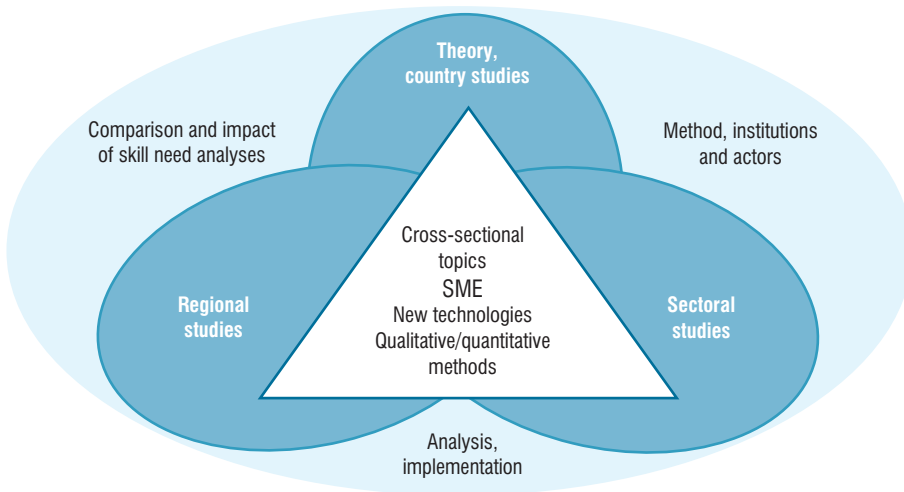
We focus on two issues: comparison and analysis of forecasts of qualification and skill needs; and ways to implement identified skill needs in training and the labour market. For this purpose we cooperate with a network of experts who have ample experience in forecasting qualification needs at regular time intervals. Based on this detailed and country-specific work, we deduce trends with respect to needs in specific segments of the labour market, as they may occur in Europe and/or in Germany. We complement these aggregate level analyses with other data: sector-based analyses of the labour market; time series studies on labour supply and demand for higher educated people; studies on the qualification needs of small and medium-sized firms; etc.

Our implementation research asks questions such as how forecast results find their way into shaping training and the labour market. The aim is to detect inhibiting and promoting effects of institutional settings for implementation. There are aspects of special interest: the role of social partners and models of worker participation in vocational training; innovative approaches like job rotation that combine training of employees with promoting transitions of unemployed workers into jobs; training of multiple job holders; innovative training arrangements in small and medium sized enterprises; and the role of public and private employment offices in advising people on training issues.

Our current research can be clustered in three broad areas. Relevant theories of information economics, lifelong learning, occupational mobility and actor-centred research are tested for their relevance to forecasting skill needs, comparing national skill systems and labour market forecasting. Two more specific clusters study the need for, and potential of, regional forecasting and sector specific analyses and possible future developments (see figure 1). Important cross-cutting topics are the impact of technological change on the skills needed in the labour market and the hypothesis of a skill-biased technological change, which works to the disadvantage of lower skilled employees and labour market entrants. Small and medium sized enterprises (SME) have below-average further training activity compared to

enterprises in general and early identification of skill needs is also below average. This has prompted research interest in understanding the reasons involved in this special situation and identifying possible remedies (Haak, 2003).

Figure 1. **Qualification needs: WZB approach**



Source: Own illustration

In the first cluster we focus, for example, on quantitative aspects of early recognition of qualification needs. Through the comparative study 'Forecasting labour markets in OECD countries' we addressed the issue of how major OECD countries measure labour market mismatches and which policies they pursue to tackle these economic growth reducing shortages (Neugart and Schömann, 2002). The study by Neugart (2000) on the supply of new engineers in Germany demonstrates the cyclical fluctuations in the number of engineers who graduate from technical colleges and universities in Germany. This analysis reveals the 'herd' behaviour of enrolments in engineering which creates large fluctuations in numbers of graduates in these disciplines. However, it still needs to be clarified, whether such herd behaviour follows 'irrational' enrolment in fashionable occupations or whether it might be a rational strategy based on the scarce information available on future job opportunities and little transparency in recruitment practices.

The second and third clusters deal with regional forecasting and sector specific analyses, and focus more on the implementation structure of already identified qualification needs. We investigate the sometimes-substantial time

lags involved in recognising skill needs in a sector, region or profession, for example nursing, and adequate responses from all actors involved. We analyse best practice in quick reaction to skill shortages and which institutional frameworks are the best facilitators for filling skill gaps rapidly. Among promising implementation features are:

- (a) employee involvement in firm level identification of qualification needs (Schömann, 2001);
- (b) enhancing 'polyvalence or pluri-activity' of employees (Rouault, 2001);
- (c) job rotation in the form that an employee on leave for training is temporarily replaced by an adequately trained unemployed person (Oschmiansky et al., 2001).

3. Why bother about future skill needs and forecasting?

The term forecasting, in business and macroeconomics, is commonly applied to analysing different scenarios of future developments, often, but not always exclusively, in a quantitative way. For some commentators, analysing qualification needs still refers to the illusion of political planning capacities widely spread in the 1960s and 1970s. Since then, forecasting techniques have improved and more care in deriving conclusions about political intervention in market processes is applied. Cooper and Layard (2003, p. 15) highlight the fact that 'mankind would be much better off if we could improve the number of accurate forecasts by even a small percentage'. In an assessment of future-oriented studies of the 1960s and 1970s and predictions for the year 2000, Schmidt-Gernig (2003, p. 255) states that the major deficiencies of these predictions were the 'underestimation of social participants' who may intervene to adapt to, or deviate from, likely trends or forecasts. Previously, skill needs forecasting was understood only as mid-term quantitative forecasts of occupations (manpower requirement approach) but today's methodologies rely on qualitative and quantitative forecasting methods as being complementary and involve a range of social actors from an early stage.

Keeping this in mind we suggest using a wider definition of the term forecasting defined as 'analysis through scenarios' (Coles, 2003) or 'anticipation strategies' irrespective of the field of application (occupations or job tasks) or whether they are quantitative or qualitative, micro- or macroanalyses. Additionally, forecasting has turned into a multidisciplinary

field no longer limited to deterministic statistical modelling, and assumptions of rational behaviour from individual actors and fully informed agents. Skills forecasting which helps to identify and anticipate shortages can reasonably be assumed to be cost-effective if the economic gains of human capital investment are likely to outweigh the costs of producing estimates, monitoring enrolment rates and lobbying decision makers to create sufficient higher level education places. However, precise comparisons of costs and benefits are still lacking and they depend largely on the accuracy of forecasts, which can only be observed several years later.

Our aim in this article is limited. We try to answer the following questions: why should we analyse qualification needs (i.e. what constitutes the economic motivation of forecasting skill needs?), who benefits from such analyses, and what type of information is most suitable for the various target groups?

3.1. Why should we analyse skill needs?

For many years – namely since the failure of qualification-planning in the 1960s [Blaug, 1967; Ahamad and Blaug (eds.), 1973] – and in many countries, skill forecasts had a poor reputation in academic circles and in political discussions. This changed in the second part of the 1990s with more intensive discussions about human capital investments and lifelong learning as part of the European employment strategy. Examples of broader initiatives to enhance the anticipation of skill needs are the FreQueNz initiative (www.frequenz.net) starting in 1999 (see the contribution of Steeger and Schmidt in this publication) and other projects in Member States [Schmidt et al. (eds.), 2003]. The most obvious difference between analyses of the 1960s and later ones is the use of multi-disciplinary approaches and the focus on forecasts as basis for broad societal discussion rather than as justification for political intervention. This view is in line with the general scepticism of quantitative forecasting.

We do not know what the future holds but we are sure that passive fatalism, to wait and see how new skill needs arise, is also less than ideal. What is needed from our point of view is different use and broad discussion of the results. So why should we analyse future skill needs? We consider two possible answers to this question. First, the growing importance of human capital and lifelong learning requires in-depth knowledge of the performance of national education systems, individual labour market preferences and behaviour, and international competitiveness. Second, the possibility of market failure and/or policy failure could lead to substantial economic and societal losses.

3.1.1.1. *Growing importance of human capital investment and lifelong learning*

Technological changes and the effects of globalisation have increased competitive pressures for the labour force. Additionally, the labour force is not a homogeneous factor; demand is rising for specific competences in a differentiated market and, therefore, so is the need for human capital investment ⁽²⁾ and lifelong learning. This need to upgrade occupational and general skills continuously applies to high-skilled employees and workers in middle and lower skill levels alike. The growing demand for more highly qualified employees requires the ability and willingness to adapt and expand skills continuously.

The demand for higher levels of human capital and continued learning can offer advantages for all participants in the labour market. Four specific aspects can be identified as benefiting from better skills matching. First, individuals have the chance for higher wages, job satisfaction and job security. Second, companies can expand their competitiveness and productivity. Third, the whole economy benefits through higher growth rates. Finally, higher education levels enhance the social capital of a nation and improve non-economic variables like crime rates and poverty.

A higher level of individual human capital, which can be denoted as the 'quantity' of education and skills (i.e. the formal degree of competences without consideration of such qualitative aspects as specific knowledge and skills) is not the single criteria of the labour market efficiency. Two more elements add to smooth functioning of the labour market. First, the need for higher qualification levels differentiates further competences with high market value within each professional group. For an engineer general engineering skills are no longer enough since, for example, highly qualified positions in product development for a telecommunications company require additional, very specific skills. Second, the simultaneity of high unemployment and skill shortages which we observe in many OECD countries (OECD, 2002; Neugart and Schömann, 2002) is a new challenge to the functioning of markets and policy making. To reduce the risk of persistent mismatch the need for more detailed information on labour market conditions, future trends and new technological developments becomes more important.

In economics, these effects are dealt with under topics of imbalances, disequilibrium or non-linear evolutionary economics applied to the labour market. The theory of mismatch and theories addresses asymmetric or

⁽²⁾ The term 'human capital' is often defined by the level of formal education. In the context of lifelong learning, not only the one-off-investment, but also additional competences and training should be included, comparable to continuing investment in a fund for life insurance.

imperfect information on both the demand side (the firms) and the supply side (employees, new entrants and the unemployed). A major hypothesis from these theories states that continuing specialisation increases mismatch problem in the labour market. There is not only the problem of cyclical demand between different professions, but also extensive cycles in recruitment within professions and even within regions. For labour market matching the kind of knowledge (in the sense of specialisation) is important. In order to increase available information and transparency of skills and qualifications, society needs broad discussions on, and analyses of, qualification needs. Improving information and developing mismatch indicators constitutes an important tool to address mismatch.

3.1.2. *Market failure and/or policy failure?*

The second important reason for analysing skill shortages is the risk of failure in the market for skills. While the mismatch argument is intuitively easy and plausible, the market failure argument is much more complex. The sources of failure in the market for skills and qualifications mainly stem from the scarcity of reliable information of present use of skills by firms and current employees as well as from the lack of information on the existing skills of current employees and new labour market entrants. The economic effects of this problem include reduction of product quality, slow-down of growth and, subsequently, a reduction in the average wage level. These medium or longer term effects justify intervention in market forces through policies either directly influencing, for example, supply or demand of student places or 'countercyclical' recruitment practices of public bodies. Experiences with such direct forms of policy interventions are mixed across Europe. More promising is the role of information brokerage as a task for public policy to ensure access of all those in the market to the best available information and supporting material to form 'rational expectations'; this is a core element in functioning markets.

Besides market failure, we have to guard against the possibility of policy failure. This could arise from providing misleading information or too lengthy delays in updating relevant information for education, skill and labour markets. Future skill analyses can only give a picture of possible developments by systematically collecting and analysing quantitative and qualitative information. For example, quantitative skill forecasts react in a sensitive way to underlying assumptions of macroeconomic growth. Predicting economic growth in the short term (< 1 year) is notoriously difficult.

In skill forecasting with time horizons of around five years it is apparent that analyses can only be expressed in a form of scenarios rather than provide information for specific points of time. Decision makers find these scenarios

useful because underlying assumptions of economic developments and change are made more explicit; systematic variations of the assumptions make more objective views of future developments possible. However, the assumptions are always partly subjective and therefore involve uncertainty. Forecasts, understood as more or less likely developments, can assist strategic decision making in educational planning or lifelong learning processes, but they are not suited to precise estimates on needed capacities, since many intervening factors are not accounted for in these models.

Responsibility for decision making remains at the political level and cannot be delegated to the analyst or scientist. The analyses – no matter whether they are of qualitative or quantitative nature, long-term or short-term – are always subject to uncertainty. This phenomenon can be characterised by a trade-off or even the possibility of simultaneous market and policy failure. The challenge is to balance chances and risks arising through the trade-off. The next section addresses our second main issue of the economic relevance of skill forecasts. For whom should these be made, i.e. who are the target groups: decision makers in the government, social actors or perhaps other groups interested in the information?

3.2. Target groups of information on skill needs

It is not only decision makers and politicians that have an interest in information about possible future developments; the public at large is also concerned. In contrast to former approaches like the so-called manpower planning models from the 1960s (Ahamad and Blaug, 1973) today's approaches are much more market-oriented. The aim of future-oriented analyses is to enhance information and transparency in the skill and labour market. Consequently, all those involved have an interest in detailed information, although they sometimes differ in the content, time horizon and degree of detail required. Keeping market orientation in mind we can differentiate three main target groups. These three groups and their main information interest are depicted in table 1.

The first target group is the government, i.e. the politicians and decision-makers in ministries and public authorities involved in education, training and labour market policy planning. Their main objective is the smooth functioning of the labour market from the macroperspective and thus, the character of their decisions is more strategic. Consequently, they do not need detailed, highly disaggregated information about short term-developments, but rather a good and reliable picture of the labour market and expected future developments of qualification needs at a macro level and within specific activities and professions in a mid- to long-term perspective. Furthermore,

Table 1. Target groups of labour market information and their main specific requirements

Government	Companies/Employment offices	Individuals
Education capacity planning, development of curricula	Reduction of the risk of upward wage pressure	Reduction of risks in human capital investment through more transparency
Efficient allocation of labour market programmes	Reduction of disadvantages of SMEs versus firms acting globally	Reduction of asymmetric information about returns on investments in education
Immigration policies	Prevention of bottlenecks of supply shortages	Reduction of risks of future unemployment

they need specific, in-depth, information on selected sectors and regions for the planning of education capacities or new curricula.

The second group is the demand side of the labour market, enterprises and the employment agencies as service provider for demand and supply side, irrespective of whether they are public or private institutions. The type of information required is determined by the target level of this group, which is operational: information in a short-term perspective on developments in specific branches, and on shortage and/or surplus in specific occupations, often at a regional level. For large firms operating at international level, information can be important to research and development activities, personnel strategies and location of production plants. Often, these firms also have sophisticated personnel management and a good knowledge of their specific future skill needs. Smaller companies are not able to devote similar resources to the early identification of their own skill needs, so their decisions are less systematic. Public provision of labour market information can reduce the bias in information availability caused by firm size. In addition, upward wage-pressure triggered by supply shortage can be reduced. Third in our listing are individuals (Table 1). They have an interest in transparent information to guide their educational, occupational and training choices. In the context of lifelong learning, it is not only those willing to enrol in an apprenticeship or study programme, their parents and teachers, who are interested in more transparency of markets for skills, but also everyone who wants to engage in further education and training.

In the information society, human capital is the key to job security and sustainable growth. Transparency about labour market developments and skill developments is the basis for reducing the risk of disadvantages and for

effective equality of opportunities. Free access to labour market and skill needs information, preferably from the Internet, is desirable and so future skill information shares many characteristics of a public good. Its provision and financing will also rely to some extent on public bodies.

4. Conclusions

In this contribution we emphasise, that despite considerable uncertainties involved in forecasting, skill needs analyses are not just desirable but are also an important tool in enhancing labour market information and transparency from an economic perspective. In part 2 we gave an overview of the comparative work of the WZB-project as part of the FreQueNz network. Part 3 dealt with the economic rationality and mentions reasons why analyses of skill needs are important elements to avoid skill shortages and market failure. We have only briefly touched on cost-benefit aspects of analysing skill needs. From an economic point of view in particular, this is an important element and should be handled with much more detail in future studies.

Early identification of skill needs across the European Union is heterogeneous, with countries varying their type of analysis sometimes according to different institutional or political requirements. Additionally, we can observe a general north-south and west-east differentiation of countries whereby northern and western EU-countries invest more efforts in early identification of skill needs than do southern or eastern ones. Interesting differences between early identification efforts occur if we focus on the target group of forecasts. Most countries address policy-makers, social partners and industrial or occupational associations. However, in modern times the speed of reaction comes from thousands of individual decision makers that derive their occupational and labour market choices on the basis of the available information and employment outlooks in their own country as well as in neighbouring countries. In some cases we encountered more ad hoc efforts rather than regular updates of forecasts on which the public could rely. Enhancing information about the labour and skill market is a precondition to creating more transparency for decision making.

A second major hypothesis of this article is that addressing future skill needs is an important contribution to avoiding market failure or extensive delay in market adjustment processes to return to equilibrium or near equilibrium levels. In the information society, it is not only the existence of intensive human capital investment and lifelong learning that is important. The reduction of asymmetric information can improve the matching in an increasingly differentiated, specialised and competitive labour market. Because different target groups

have an interest in the information, efforts should be made to provide it in the public domain. Ease of access is crucial and an integrated internet platform is indispensable nowadays. This kind of information tool satisfies the demand of a public good because a wide and free of charge access to the information is most likely to yield the desired effects of fast closure of skill gaps or timely adaptation to new skill needs by many individuals.

Third, in a world undergoing globalisation, looking beyond borders makes sense from more than a purely academic perspective. Detailed knowledge of efforts and institutional settings in each country must be compared to identify best practice examples. Another important issue is the common pattern that evolves when we assemble recent developments in skill needs across Europe. Common trends, like increasing needs for 'soft skills', arise but common failures also occur, for example the difficulty in addressing shortages of engineers or persistent gender imbalances in occupations in a timely fashion. Continuing European harmonisation, comparable institutional settings in different Member States and growing international mobility require a renewed effort for European cooperation. There is one remaining certainty: we know that we do not know what the future will bring us. However, systematically analysing previous developments and considering possible evolutions or scenarios is a possible way of being better prepared for the future. Much is already gained if unpredicted events or trends are disclosed earlier and strategic responses implemented more quickly.

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PART III

Good practice and different practice: examples of approaches and transfer to policy and practice

This part is based on presentations and discussion at the workshop, moderated by Ulrich Hillenkamp, European Training Foundation. The workshop discussed examples of initiatives and modes of cooperation in various European countries, looking at different methodological approaches of identification, monitoring and anticipation of skill needs. The workshop participants also focused on implementation of initiatives and transfer of research results into policy and practice. A summary and conclusions of results of the workshop discussion is provided in the contribution of the workshop rapporteur Eleonora Waltraud Schmid, Cedefop, at the end of Part III.

Contributions in Part III

Loek F.M. Nieuwenhuis

Keynote: **Making the future: dealing with uncertainty in developing and delivering vocational education and training**

Olga Strietska-Ilina

Keynote: **Skill shortages enquiry by a combined method**

Mike Coles

Making qualifications fit for the future

Mario Gatti

A network for identifying skill needs in Italy

Jordi Planas

**Identifying interactions between global and local developments:
the Observatory for the detection of skill and training needs
in the Barcelona region**

David Parkes

**Transfer of pilot initiatives into policy and strategic implementation:
perspectives from transition countries**

Eleonora Waltraud Schmid

**Good practice and different practice: examples of approaches and
transfer to policy and practice. Summary and conclusions**

Making the future: dealing with uncertainty in developing and delivering vocational education and training

Loek F. M. Nieuwenhuis

Stoas Research, The Netherlands

This contribution challenges the usefulness of prospective data for educational policy design. We all know that the future is uncertain, but for policy goals we pretend that the future is as certain as possible. Forecasting techniques are used to scan future developments and to provide insights for identification of skill needs as early as possible. Forecasting techniques are not a waste of time but policy making deals with uncertainty. Forecasting can reduce uncertainty to a certain extent, and can help to discover smart policies. However, the real challenge is to develop a learning policy strategy with continuous feedback cycles. Forecasting techniques, combined with evaluative monitoring, should be built into those feedback cycles, in order to play a sophisticated role in policy design and redesign, both at a system level (governmental policies) and a practical level (corporate policies).

The contribution presents experiences with some practical tools (interactive scenario building, a logistic model for responsive vocational education and training) in order to underpin the challenge of a cyclical model of learning.

1. Introduction

Developing curricula for vocational education and training (VET) requires forecasting techniques. We need information on future jobs to design job profiles as a basis for VET. However, we see an emerging knowledge-based economy (Mayer, 2002) in which hyper innovation causes such fast developments and changes, that forecasting techniques are inappropriate as a sole base. Psacharopoulos (2003) made clear that even in the more stable

economy of the late industrial era in the 1970s and 1980s, manpower forecasting techniques were quite unreliable. So the time lag between curriculum design and graduate delivery is too large to trust as sole forecast of skill needs.

In this article I would like to challenge the usefulness of prospective data for (educational) policy design. We all know that the future is uncertain, but for policy goals we pretend that the future is as certain as possible. Forecasting techniques are used to scan future developments and to provide insights for identification of skill needs as early as possible.

The aim of this contribution is not to suggest that forecasting techniques are a waste of time and energy, but to emphasise that policy making involves a great deal of uncertainty. Forecasting can reduce uncertainty for a small extent, and can help to discover smart policies. However, the real challenge is to develop a learning policy strategy (Van der Knaap, 1997; Walker, 2001), in which continuous feed back cycles are built in. Forecasting techniques, combined with evaluative monitoring of trends, should be built into those feedback cycles, in order to have a sophisticated role in policy design and redesign, both at a system level (governmental policies) and a practical level (corporate policies).

2. A cyclical model

For the development of (competence based) VET, we developed a simple feedback model (Gielen, 2000; figure 1).

In this model developments in the labour market are a major source for competence standards. There is an important difference between competences for work and work-related competences (Toolsema, 2003). Competences for work have to do with job specific demands; work related competences have to do with getting and keeping a job, such as career skills and learning skills. In the employability discussion, work-related competences are becoming increasingly important.

Given competence demands, competence standards have to be developed: how can you assess somebody's skills? Often reduction of information occurs in this phase to produce a lean and transparent set of competences to be handled in the VET system. An example of such reduction techniques can be seen in the *Lernfelder* discussion in German VET.

Based on these standards, learning processes (instructive within classes, constructive in work environments) have to be developed and executed. The triangle of student, teacher and workplace is pivotal in this process. At the

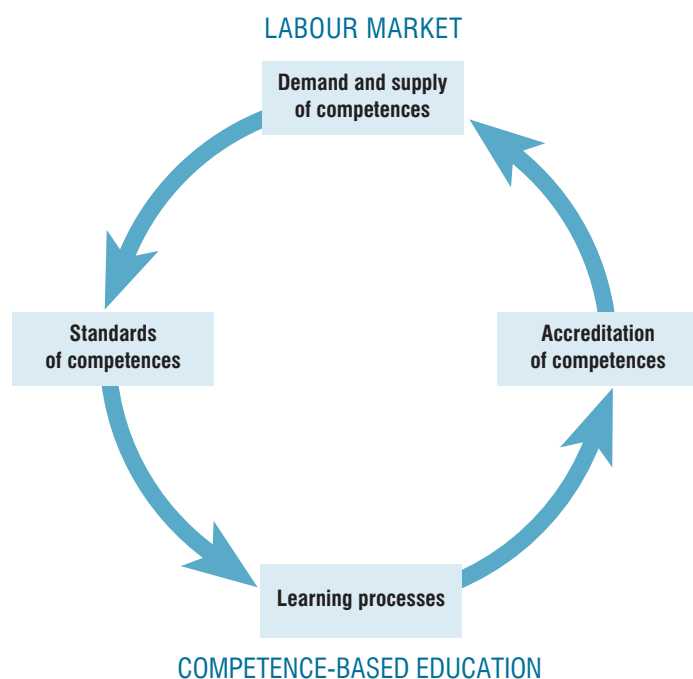
same time this triangle is the major source of irregularities in the competence production chain.

Assessment procedures, consistent with the learning processes, should prove that students possess target competences at an entry level. Full competences can only be delivered by years of work experience.

The proof of this occurs in the labour market: getting and keeping a fitting job. Data on success in the labour market of young people after school completion should give new input for the next learning cycle.

This cycle makes clear that skill needs information is only a small part of the developmental process. At all stages 'disturbing' processes occur, causing information reduction and adding other grounds for taking decisions.

Figure 1. **Design model for VET**



Source: Gielen, Reitsma and Wilbrink, 2000

3. Strategies for the future

Education, including VET, is traditionally designed within a context of certainty: knowledge is judged as true and objective and the instructional techniques are authoritarian, receptive and non-participative. In most VET systems job profiles are handled as true and objective information. The institutional demands in the labour market focus on the exchange value of competences (accreditation and acknowledgement of labour rights; cf. Tomassini, 2000), which imply the stability of qualifications as currency. This emphasis on stability causes the utility value of competences (what to do and how to use in the workplace?) to decline, by a process of canonisation (Brown and Duguid, 1998). The utility value of competences has to be developed after finishing initial VET instead of beginning to develop within VET trajectories.

The exchange value of competences is deeply rooted in the structure of VET. It is a central institutional asset (Nieuwenhuis, 2002): both employers and trade unions support this value strongly. For employers the exchange value implies certainty in hiring processes, reducing transaction costs, while for workers the exchange value forms a guarantee for their labour market success. Thus the exchange value of competences is an unavoidable aspect, because of its (assumed) stability, but the utility value should be brought back in balance.

In the emerging knowledge-based economy, the predictability of skill needs will decrease rapidly. Training policies based on certain outcomes will have to be replaced by policies focusing on the quality of learning processes and learning skills of employees. Work-related skills will gain importance over direct work skills. Flexibility and diversity should be organised at all levels: flexible expertise of workers, flexible training supply by colleges, flexible regulations from the government. Prescriptive policies are doomed to fail in preparing VET for the future of the knowledge-based economy.

It is important to be aware of the future's potentials. Three different kinds of potentials can be sketched:

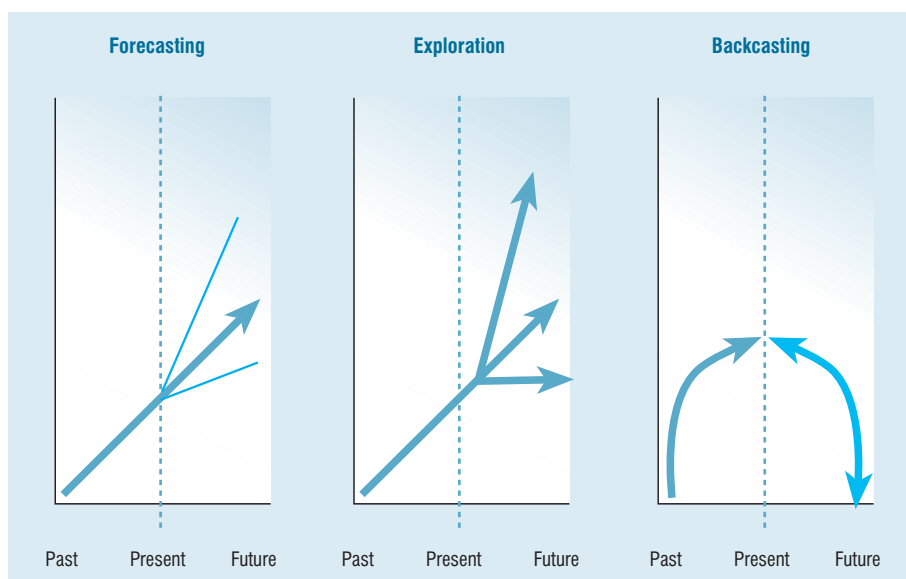
- (a) the foreseeable future: based on what we already know, we can foresee a part of the future, especially when timescales are not too large: the nearby future (one, two years, depending on the field we are working in) is quite predictable;
- (b) the unexpected future: we know for sure that many unexpected events will happen in a haphazard way. 11 September 2001 is a striking example of huge impact events we could not foresee. On smaller scale we all

have experienced events we could not foresee, but we have survived more or less effectively;

- (c) the imaginable future: a third part of the future can be formed through our own fantasy. Depending on our self-efficacy and locus of control, people are able to implement (parts of) their fantasies and wishes for the future by taking appropriate chances. Because of the haphazard nature of the future we can take those chances, depending on our entrepreneurial competences.

Forecasting uses only the first of these future potentials; ambitious policy making should use the power of images (Banathy, 1996) and should give space to images and ambitions of students to help create their own future jobs. Learning policies should also be prepared for unexpected events (Walker, 2001) and feedback mechanisms should be built into policy design, to monitor and to react to the unexpected. Banathy pleads for an intelligent approach for system evolution and system design: the future is not a mechanistic extension of the present. 'The ability to shape change – rather than being its victims or spectators – depends on our competence and willingness to guide the purposeful evolution of our systems, our communities, our society' (Banathy, 1996, p. 1).

Figure 2. **Methods for scanning the future**



Source: Bilderbeek et al., 2002

There are several methods for scanning the future, reflecting to different degrees the optimism in Banathy's plea. Most forecasting techniques are based on data from the past, with trends extrapolated towards the future, sometimes embedded in optimistic and pessimistic alternatives. Such techniques are not resistant to unexpected events and do not reckon with active design efforts.

Exploration techniques are used for dealing with the unexpected and creative part of the future. Scenario techniques are well known for developing future constructs in an intelligent way, using forecasting techniques as a basis, but going beyond the extrapolation of existing knowledge.

Backcasting techniques are used for trials of how to realise fantasies. The starting point in these techniques is the designed, desired future, from which backward reasoning leads to policies for the present time.

In smart policy design, mixed strategies are used, consisting of forecasting, backcasting and explorative methods. However, in most cases they are used in a linear way: based on the threefold information, policies are fixed and put into action in an inflexible, unlearning way. This is policy design as a blueprint factory. Adaptability and learning capacity is needed in policy making for dealing with structural uncertainty (Walker, 2001).

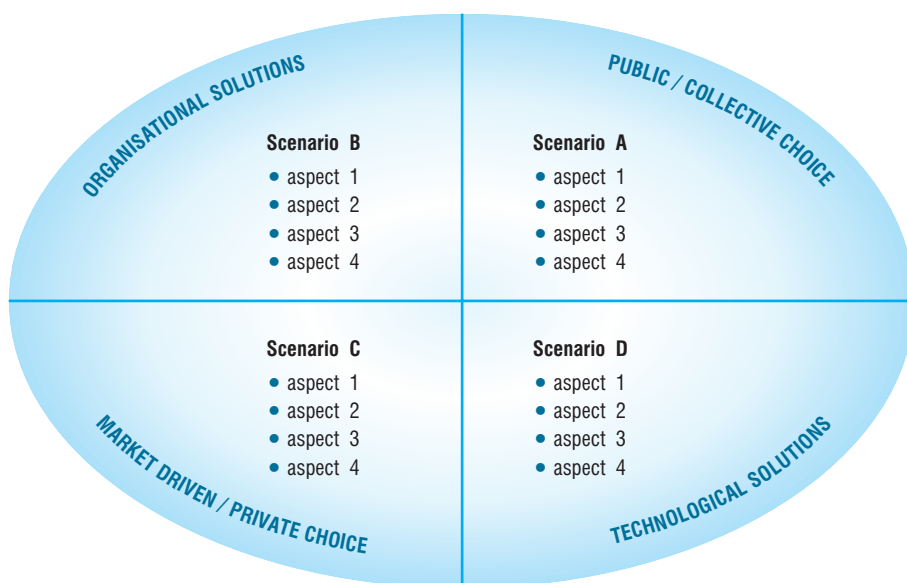
4. Scenario analysis as an example

Scenario analysis is a type of complex forecasting technique: combining the extremes of extrapolated dimensions in different ways, gives the opportunity to build a variety of outlooks for the future. The process of building scenarios interactively is often more important than the final output in scenario descriptions. Managers and policy-makers often see the future as an extension of today; the scenario building process makes them aware of their own prejudices and narrow views.

A common approach to scenario building (but not the only one) is taking two central dimensions of the domain of interest, mapping out four different scenario fields. Other important issues are built in as common aspects, to be dealt with in each scenario. During the construction process central dimensions and common aspects often turn out to be interchangeable. Figure 3 presents an open scenario system; figure 4 presents an example, made for management decisions within a Dutch agricultural-educational institute. Trend information is gathered, as in forecasting research, for each of the dimensions and aspects and extrapolated in extreme combinations.

The construction process ends up with four imaginable and consistent worlds, all fitting with existing statistical data (by playing with optimistic and pessimistic alternatives).

Figure 3. **Plotting the playground**

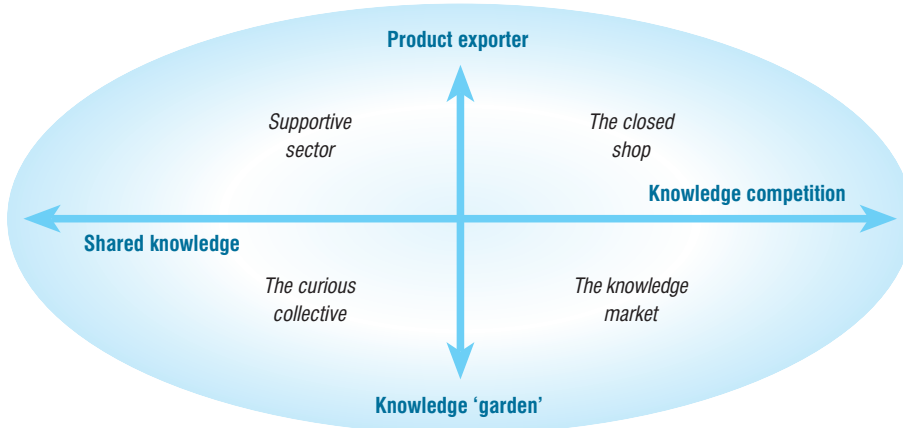


Source: Bilderbeek et al., 2002

Figure 4 shows an example of a scenario analysis for knowledge production within the Dutch agricultural sector. The vertical dimension is about the kind of products to be produced: e.g. vegetable commodities or specialised knowledge for innovation in agriculture. After World War II, Dutch agriculture developed into one of the most successful exporting systems in the world (next to the USA and Denmark). The increasing density of the Dutch population has created immense competition in the use of scarce space and WTO discussions have changed the protective food policies of the EU. Therefore, the sector has to redirect itself, with the production of highly innovative products as a realistic alternative.

The horizontal dimension is the social cohesion under which the sector has to work: cooperation or competition. All extreme positions are imaginable, based on past and present trends and figures. The combination leads to four different future worlds with large different consequences for economic, educational and science policies.

Figure 4. **Four scenarios of Dutch agriculture in 2008**



Source: Nieuwenhuis and le Rütte, 1998

Within such four scenarios, different policy strategies can be built in, e.g. labour market and training policies. By this, analyses can be made of the robustness of strategies (applicability in more than one scenario) and policy risks can be estimated. So, policy making can be made smart.

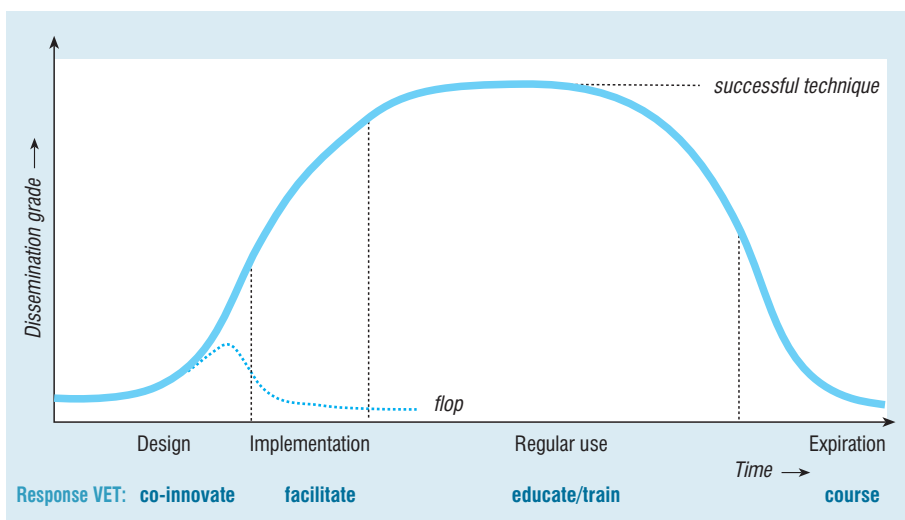
However, using scenario approaches is risky. Policy-makers and managers tend to believe in their future scenarios, fitting the best into their policies. They forget that each scenario has a probability of zero occurrence in reality. Wishful thinking is part of policy making. Political scientists (Walker, 2001) warn of such approaches, exactly because of the unpredictability of the future. A second risk is that robust strategies are middle of the road: to realise optimal results, chances have to be taken by sometimes choosing extreme policies. The third risk is linear thinking: design, implement, execute and (sometimes) evaluate. However, policies influence the future in unexpected ways (self-fulfilling and self-denying prophecies), so constant reassessment is necessary.

5. Adaptive policy design as challenge

Walker (2001) pleads for a learning policy approach, which is prepared for smart adaptations of designed actions. This implies sharp actions for the near future and more open, fuzzy lines for the longer term. Policy design should be incremental in nature, developing over time and reacting on all kinds of

signals. Future views such as forecasting, scenarios and backcasting should result in awareness of the vulnerabilities of designed policies. Walker argues that precisely at the vulnerable spots in the design, signposts and monitoring systems should be installed and hedging actions should be prepared. Policy-makers should be prepared to adapt their measures and regulations according to the results of monitoring. For policy-makers this means a cultural shift: they have to show vulnerability instead of certainty. This is a major problem in momentary politics (Van der Knaap, 1997).

Figure 5. **A logistic model for responsive VET**



Source: Nieuwenhuis, 1993

For curriculum development in VET, we formulated a line of thought analogous to adaptive policy. Figure 5 offers a practical example of adaptive policy in skills needs identification. It is a logistical model for monitoring changes in skill demands and translation of demands into course supply. The bell curve represents the life cycle of a new technology (process, product or service), as a *pars pro toto* for innovation. Five stages can be discerned, with different action patterns for course delivery:

- in the design or creative stage of new developments: VET (i.e. colleges, teachers) should just be there and participate, knowing what is happening and experiencing movement (both students and teachers);
- in the implementation stage: facilitate learning processes on the shop floor by reflection; delivery of tailor-made short courses;

- (c) when new developments are going to ‘flop’, no further action is needed. It is difficult to forecast that with certainty;
- (d) from implementation to regular use: embedding the knowledge of former stages into regular courses and training delivery;
- (e) in case use ends: retract courses from regular training supply (one of the difficult decisions for teachers and colleges); keep expertise updated for later users.

The example shows that skill need identification is not a simple binary button, but implies understanding innovative processes and the risks of failure. The policy reaction is analogously not binary: the different stages for course delivery can only be set into action, based on a sophisticated monitoring and interpreting system.

6. Concluding remarks

Design of VET policies, both at macro (EU and national) and local level (colleges and companies), is not a matter of linear thinking from forecasting data towards course delivery. The future is haphazard, and forecasting techniques are not able to reduce that uncertainty. Smart policy has to be proactive: creating the future by knowing your targets and the targets of other relevant players in the field. This needs political and societal debate, which can be scaffolded by trend analyses and other techniques for future scanning. Available data should be used smartly. Prescriptive regulatory systems are not for designing blueprints, but for knowing and naming vulnerabilities in policy design. Policy making means balancing between the Scylla of planned economy and the Charybdis of chaotic anarchy. Trusting the results of forecasting techniques fits the model of a planned economy, whereas an open training market will not lead to general upskilling of the workforce (Crouch, Finegold and Sako, 1999; pp. 196-218). Policy design has to be seen as an intelligent human action, says Banathy (1996), in which creative and reactive activities have to be in balance.

VET policy should be prepared for change, based on a cyclical model of policy learning. Monitoring, evaluation and reassessment should be built into policy design, to be able to adapt continuously to the changing environment without losing sight of agreed targets.

Navigating VET through the ocean of the knowledge-based economy is a creative skill: the weather forecast delivers essential information, but choice of destination does not depend on it. That is a matter of political discourse!

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Skill shortages enquiry by a combined method

Olga Strietska-Illina

*National Observatory of Employment and Training,
National Training Fund, Czech Republic*

The article focuses on the problems of integrating different methodological approaches of forecasting and anticipating skill needs. The current approach in the Czech Republic is explained and exemplified by the research into the problem of skill shortages.

Although few Czech companies report recruitment difficulties and skill shortages, the consequences reported by companies are very serious. The perceived skill shortages may not, however, provide a totally objective picture. In addition to the company research, other surveys and corrective methods are used.

Besides discussing actual findings, the article tackles some systemic and methodological issues that can allow early identification of skill needs in a systematic manner. The role of continuing knowledge exchange between expert institutions is indispensable not only at national level, but also within and among international networks, along with active use of information platforms at different levels.

1. Introduction

The National Observatory of Employment and Training provides applied policy research on responsiveness of education and training provision to labour market demands. Apart from other fields of expertise, it has been particularly active in skill needs analysis. Most recent projects capitalise on previous practices and methods in Europe. The 'LABOURatory' project (Forecasting of training needs, 1998-2001) attempted to develop a medium-term forecasting methodology applicable in transition economies and to combine the quantitative approach with 'softer' qualitative instruments. The project included the joint efforts of expert institutions from six European countries. An unintentional result of the project was an informal network of

institutions that continues to cooperate in the framework of the project follow-up as well as of other activities.

Follow up activities included a proposal for early anticipation of skill needs in the Czech Republic with definition of institutional responsibilities, identification and integration of multiple resources (2002-03), plus further work on methodology improvement and integration of methods and actions at different levels.

New activities include analysis of skill needs and human resource development in small and medium-size enterprises in the Czech Republic (2002-03); research into specific skill requirements to facilitate innovation, new technologies, research and development in enterprises (2003); and identification of skill shortages in the Czech labour market (2002-03), the main focus of this article.

These activities aim to solve a number of problems inherited from the socialist planning system. The Czech Republic, as with other future Member States, formerly used prognostic research linked to economic planning. This has been abandoned and efforts are now being made to elaborate modern research methods and techniques, a difficult task given that association of forecasting with the former planning practices creates scepticism about such research. The background to this is a weak system of social partnership and limited participation of employers in definition of skill requirements in the labour market. The situation makes analysis of skill needs a challenging but increasingly necessary task, and the need for methodology development is being slowly recognised.

Verify existing methods meant facing a number of problems. First, there is no universal method of skill needs analysis to adopt and there is a large pool of information and practices in Europe to take into account. Second, is the lack of necessary data (both in stock and flows) in the Czech Republic. Third, is working under the conditions of a non-systemic approach, mostly working on a short-term project basis with limited resources. Efforts may not have solved the problems but we hope they, at least, increased the transparency of the current situation and identified future tasks. One of the efforts is the study of skill shortages, applying a complex 'combined' methodology which took into account existing practices and instruments in a number of European countries.

2. Terminology and methods

We use the term 'skill shortages' as an overarching term. It is a slightly adopted definition of National Skills Task Force, UK, where 'skill shortage' is a genuine lack of adequately skilled individuals available in the accessible labour market with the type of skill being sought and which leads to a difficulty in recruitment (NSTF, 1998). A skill shortage characterises the situation where employers are unable to recruit staff with the skills they are looking for at the going rate of pay (EEO, 2001). This could result from basic lack of labour (when unemployment levels are very low), significant geographical imbalances in supply (sufficient skilled people in the labour market but not easily accessible to available jobs), or a shortfall in the number of appropriately skilled individuals, either at new entrant level, or for higher level skilled occupations (NSTF, 1998). We can also speak of 'labour shortage' (lack of workforce), 'shortage occupations' (lack of the workforce in specific occupations), 'skills gaps' (the qualitative mismatch between the availability of human resources and the requirements of the labour market) and 'recruitment difficulties'.

Our methodological approach combined available data and included several surveys. Some aspects of the methodology will be implemented in the future when the data is available, e.g. data from the econometric forecasting model, time series of vacancy statistics and others.

To measure the main trends in employment and skills, we mostly analysed dynamics data on employment by sectors, industries, occupations and education levels in the Czech Republic and, where possible, in comparison with selected Member States and accession countries.

Vacancy statistics are not comprehensive in the Czech Republic, covering only roughly half of all available vacancies. In addition to using the standard vacancy statistics from Public Employment Services (PES), we carried out a firm-level survey among 900 enterprises. We hope to enlarge the sample in future, so that micro and meso level data become more robust. We were aware, however, from previous surveys among employers, that enterprises often cannot objectively foresee future employment demands on qualifications and skills; they also underestimate the requirements of adaptation to technological change and competitiveness in a larger Europe. Hence we performed additional surveys.

A survey of PES covered all labour offices in all regions. A survey of 277 private employment agencies (headhunters) was considered useful as 18 % of companies use them for recruitment purposes. Content analysis of

vacancy advertisements in selected printed and Internet media also offered interest given that 53 % of companies use advertisements in printed media and 8 % use job web sites in their recruitment practices. Data from a survey among investors in manufacturing, which covered 183 companies, were made available by CzechInvest.

All these sources and data are biased or incomplete one way or another. For instance, vacancy statistics and public employment services (PES) mostly operate at the lower end of qualification levels due to vacancy registration practices. In contrast, content analysis of advertisements in printed and Internet media, as well as the survey among private employment agencies, provides comprehensive information about higher qualified labour. The enterprise survey showed that companies with foreign capital, and especially start-up investors, have not only different human resources practices but also distinct experience with skill shortages in the labour market. We use the survey among employers as a primary source and other surveys as additional information. By combining them we obtain qualitatively new information, which provides us with a more reliable and complete picture. In our methodological design, we used experience of other countries and institutions, such as the Research Centre for Education and the Labour Market in the Netherlands (ROA), the Skills Task Force in the UK, the European Employment Observatory, the French system of prospective studies and experience of Regional Observatories of Employment and Training in France.

3. Study results

3.1. Main trends

First we measured trends in employment and education and training. It is important to note that we do not speak about a standard statistical analysis. In general, we prefer dynamics data to static information and qualitative analysis to a pure statistical one. This also arises from data availability and robustness of individual data.

Analysis of employment trends by sector in the Czech Republic, compared to the EU, shows that the service sector has the largest growth potential in the Czech Republic, capable of absorbing not only lowly qualified but also medium and highly qualified labour. Employment in both agriculture and industry has experienced a steep decline during recent years and although the nominal share in employment in industry is still higher than in most Member States, the number employed in these sectors in the Czech

Republic will remain stable or decrease insignificantly. The service sector is also likely to experience the most acute skill shortages in the future.

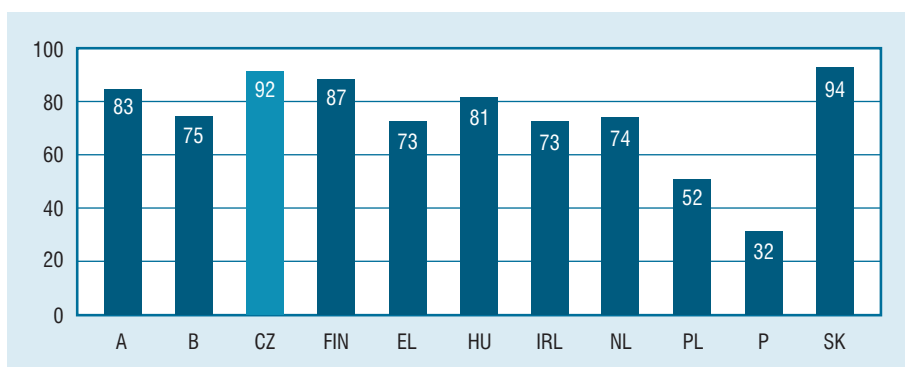
Figure 1. **Average employment change by sector in EU-15 and the Czech Republic, 1996-2001 (in %)**



Source: calculated from EC, Employment in Europe, 2002 and ČSÚ, 2002

Changes in labour force supply demonstrate rather flexible reaction to the employment trends, where general upskilling is evident. In general, the education system reacts well to the demands for a more highly qualified labour force, at least as far as formal qualifications are concerned. Also comparison of the percentage of the population, which attained at least upper secondary education, demonstrates very good results for the Czech Republic.

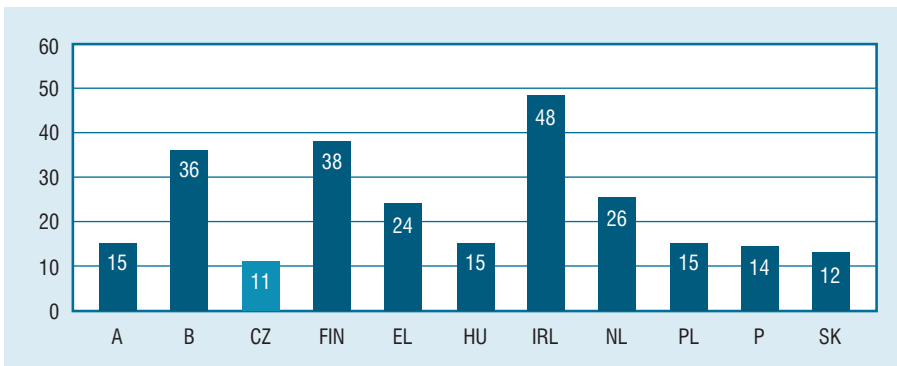
Figure 2. **Percentage of the population that has attained at least upper secondary education, in the age group 25-34 (2001)**



Source: Education at a glance, OECD indicators 2002

However the situation is very different when we compare the population that has attained tertiary education in the same age group in selected European countries. The level achieved in the Czech Republic is warning and does not correspond to the upskilling trend in the labour market. OECD comparisons of the dynamics of educational attainment levels between younger and older age groups demonstrate that the situation in the Czech Republic might be characterised by stagnation. In spite of growing enrolment rates in tertiary level education in the Czech Republic, the strong side of the Czech labour appears to be in the medium range of qualifications.

Figure 3. **Percentage of the population that has attained tertiary education, in the age group 25-34 (2001)**



Source: Education at a glance, OECD indicators 2002

The question is whether then the main lack of highly skilled labour leads to recruitment difficulties in the Czech Republic. Here the company survey was especially useful.

First we observed a general increase in recruitment problems reported by firms compared to the situation three years ago, especially in the cases of technicians and associated professions, services and sales people, plant and machine operators, craft and trade workers. Dynamic firms with growing labour productivity, technological development and innovation are most affected.

3.2. Labour shortage and recruitment difficulties

According to the survey, 12 % of firms experience recruitment difficulties. Larger organisations experience more problems with finding suitable personnel. Above average recruitment problems were recorded not only in

regions with low unemployment rates (e.g. North East Bohemia, unemployment rate 5 %, and 17 % of companies reporting difficulties), but also in regions with high unemployment (e.g. North West Bohemia, unemployment rate 10,7 %, and 22 % of companies reporting recruitment difficulties). In the former cases we can speak of tightening labour markets but the latter display characteristics of skills mismatch in local labour markets and also, possibly, low interregional mobility. It is, however, important to note that there could be other reasons for recruitment problems than labour force supply.

So far, labour shortages are not seen by employers as an acute problem. Contrary to the initial hypothesis, employers mostly report lack of skilled workforce in the medium range of qualification levels, i.e. skilled workers, in particular in machinery and construction, other technical branches and in services. Nevertheless, past experience and future assumptions of employers suggest there will be a shift toward shortage of higher qualified and better educated workforce.

It is, however, a question of whether we can speak at all about the labour shortage *stricto sensu*. Analysis of shortages in the qualified labour force, based on the surveys of employers, employment services and private employment agencies, demonstrated that such reasons as nature of work, lack of labour force mobility, inadequate wages, prestige of the job or industry, limited career opportunities, etc. predominate. However, insufficient supply or inadequate structure of supplied labour are also often mentioned as the cause of labour shortages, as well as inadequate quality of education and, in some branches, a pace of technological change that is difficult to reflect in a timely manner in education provision.

Two main groups of occupations suffering from skills shortages can be identified by cross-referencing a number of inputs. Inputs include:

- (a) number of school leavers in the related educational disciplines and levels;
- (b) their success obtaining employment, based on available statistics and on the PES survey;
- (c) gross monthly wages for workers in specified occupations compared to average levels; and wage growth compared to average wage growth;
- (d) the opinions of employers, PES and headhunting firms on reasons for shortages and recruitment difficulties.

The first group consists of construction workers, bricklayers, dressmakers, managers, secretaries, cooks, and waiters. The main reasons for skill shortages among this group are inadequate structure of the workforce supply in local labour markets, low inter-regional mobility of the labour force, inadequate quality of job seekers and, in particular, inflexible market

adjustment with regard to working and financial conditions.

The second group consists of sales workers and dealers, construction technicians, machinery workers and technicians, design engineers, nurses, doctors, teachers and trainers, IT specialists and programmers. Here we can speak of real shortage of labour. Moreover, IT specialists and programmers, doctors, design engineers, construction and machinery technicians belong to occupations with above-average monthly wages and above-average dynamics of income growth. In latter cases we may speak about the so-called high-wage skill shortage, when flexible market adjustment cannot keep pace with the rising wage costs of those with required qualifications and skills.

3.3. Skills gap

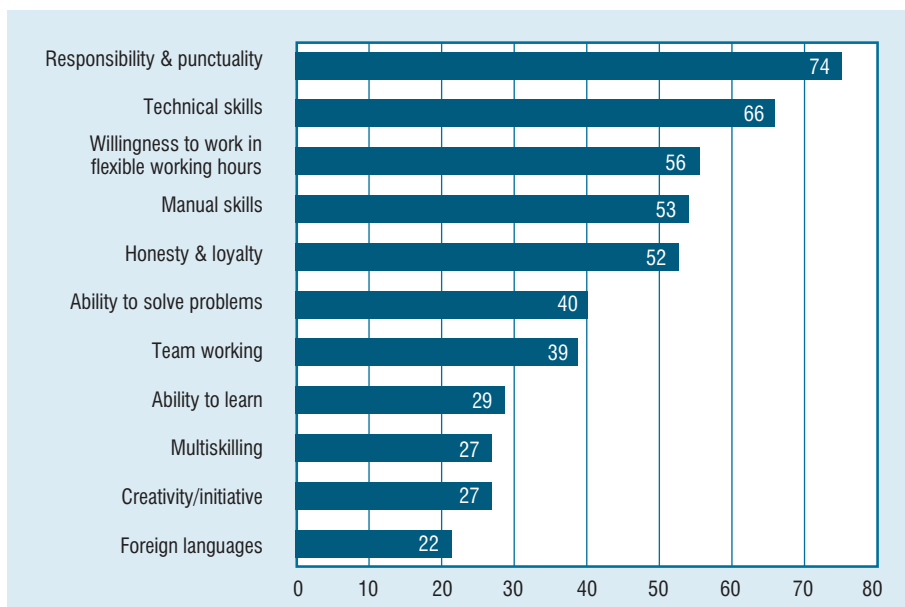
The combined methodological approach also produced qualitative information on skill shortages. Enterprises, PES and headhunting firms were asked which specific skills and knowledge are missing among their current personnel/clients, specifically for job applicants and school leavers. This information was analysed for specific occupations, qualifications and levels/types of education. We could enrich this information by analysis of vacancy advertisements in printed media and on job websites compared with previous years (1999, 2000, ÚIV 11/2000, ÚIV 6/2000), looking for changes in qualitative requirements for the workforce. Here we provide only the most general findings that follow from the combined method.

About 9 % of firms report long-term problems with lack of specific skills among employees and job applicants. SMEs report skill gaps more often. Interregional differences are very big (e.g. in Prague only 3 % report skill gaps while in South-West the figure is 18 %). Slightly more companies recognise that skills level and workforce quality must improve for the sake of competitiveness after accession to the EU.

Personal abilities and behavioural features are often mentioned among specific qualities missing among the workforce, whereas qualities related to attitude to work are very frequent. A large number of companies report technical, i.e. profession-related skills, as missing. This is a warning message but the problem mostly concerns the workforce trained in shorter vocational studies (up to three years' duration) and, to a much lesser degree, those with complete upper secondary level and higher education. Those with higher education are regarded positively while the worst evaluation was given to the lowly educated, especially those with only compulsory educational attainment.

All the surveys carried out showed that knowledge of foreign languages and IT skills represent the most significant element of skill gaps: the current

Figure 4. **Specific skills, competences and qualities reported as missing – results of the enterprise survey**



Source: survey by Median / NOET, 2002

labour market expects these features to become an integral part of every qualification at virtually all levels of education. Other skills missing among the workforce are teamwork, problem-solving, ability to work with and efficiently sort large amounts of information, leadership, creativity, interpersonal communication, responsibility, reliability, honesty and loyalty.

4. Consequences of skill shortages

Although few companies are aware of skill shortages, 43 % of firms report a negative impact from skill shortages on productivity and output. SMEs are more affected than larger enterprises. Other consequences mentioned are lower quality of products and services, loss of profits, higher demands and pressure on current personnel, serious barrier to further development, necessity to outsource production and services. The result from the surveys confirms the serious consequences of skill shortages for competitiveness of firms, regions and the overall economy.

The coming EU accession and a gradual opening of the labour market, with greater mobility of labour across state borders, may result in a greater outflow of skilled workers. Economic competitiveness based on middle-range qualifications under the conditions of the single market will not work. The shift in qualification requirements towards higher skilled labour is a trend which unequivocally follows from the surveys.

This trend is especially clear in more dynamic companies with growing productivity and higher exports, enterprises that perform research and development for technological change and innovation. For candidate countries, where competitiveness is still often based on the price of the workforce, it is important to avoid the 'low skill trap' (Haskel and Holt, 1999), becoming a European 'assembling yard'. Under a developing knowledge-based economy in Europe, upgrading skills and supporting provision of higher qualifications for the population could also be a deliberate political decision to reinforce economic competitiveness, and may go far beyond filling in identified gaps and shortages.

5. Future research challenges

Given the seriousness of the consequences of skill shortages, it is necessary to establish regularity in such analyses. Our combined methodological approach proved to be useful but demanding, not only in terms of analysis but also in resources and the scope of the work. It allowed us to grasp the situation at national level and also to identify the main problems at regional, sector and enterprise levels, although in outline terms. For more reliable and comprehensive information at a micro and meso level, we need to increase the samples and regularity of the surveys. Integration of resources and actions among different institutions and joint work appear vital.

The Czech National Observatory is now considering establishment of a national platform on analysis and identification of skill needs which should provide access to available information, research, methods and tools in the country. However, simply sharing knowledge at national level is insufficient, our analysis illustrating how much we learned and benefited from research done in other countries and methods used there. We also could see that our access to information and knowledge in other countries was limited, being bound by the publications and working papers available from our partner institutions, at individual Internet sites and in libraries. It is clear that a great deal of information is not shared. Thus we would be happy to use our efforts in the creation of an information platform with expert institutions abroad, with

a view to exchanging information on new research results and methods at European level.

As well as this information platform, an international network of experts and institutions in analysis and identification of skill needs could help launch a new era of combined, and perhaps even interdisciplinary, research.

Finally, many researchers often forget that mere identification of the problem does not, by itself, introduce changes. We need to go beyond identification of skill needs to actual recognition of the problem by all relevant actors, where the dissemination role of national networks and of a possible European platform is essential.

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Making qualifications fit for the future

Mike Coles

*The Qualifications and Curriculum Authority (QCA),
United Kingdom*

Early recognition of qualification needs has been a problem for the UK for many years. Barriers include poor labour market data, long gestation times for developing qualifications and weak methods for collecting and analysing information about future qualifications needs. This contribution concentrates on the potential of a new methodology, based on scenario planning, for maintaining an up-to-date set of qualifications that can serve individuals, employers and the economy well.

Scenario planning has been used in identifying qualification needs in three transport sector industries in the UK: road haulage, motor vehicle sales and servicing, and rail passenger transport. The reactions of labour market experts in these industries to the new method are provided and also included are some pointers for future development of application of the method. Some issues have also been raised. Who should develop scenarios? When should they be used in the needs analysis process? How industry specific should they be? What is an appropriate future time projection for preparing scenarios?

Most experts reacted positively to the scenarios exercise and evidence suggests that needs analysis exercises in the industries were enhanced by the method. For example, tables were prepared which compared skills needs identified by traditional methods and those additional skills which were identified specifically by the scenarios exercise. Two key outcomes of the work were the capacity of the scenario method to combine qualitative and quantitative data and to deal with skills supply side information simultaneously with demand side data.

1. Introduction

Early recognition of qualification needs has been a problem for the UK for many years. There are barriers to building qualifications that recognise skills needed in the workplace now and in the not-too-distant future. These barriers include poor labour market data, long gestation times for developing qualifications and weak methods for collecting and analysing information about future qualifications needs. This article concentrates on the development of a new element of a needs analysis strategy called scenario planning which helps to create an up-to-date set of qualifications that serve well individuals, employers and the economy.

Major benefits (Leney and Coles, 2001) for individuals, employment and the economy can flow from a qualification system that is clear, helpful and efficient. A qualification needs analysis process is essentially a modernising process - a way of making sure that users of qualifications – and the framework of qualifications – feel confident about the content and structure of qualifications and the relationship between them. The logic then continues: if qualifications recognise the right skills, and people are inclined to achieve the qualifications, a positive effect on the career of the individual, skills supply to the economy, the economy of the sector and international competitiveness will follow.

2. How are UK qualifications developed?

The UK qualification system is based on certain well-established and well-defined qualifications. These have been developed and managed within universities and the professions and, accepting recent government activities to regulate the qualifications system, it is probably true that the UK has a qualifications system that is devolved and voluntarist. Government action has been aimed at rationalising the system; maintaining the demand of assessments and creating a recognition system for those who have poor access to qualifications, such as unemployed youth. Recently the government has been attempting to arrest the rapid decline in the use of apprenticeship as training and as a qualification.

Within the EU, the methods (Sellin, 2001) for early recognition of skills needs include:

- (a) examination of job specific qualification needs,
- (b) examination of individual occupations,
- (c) comparative qualifications analysis (cutting across occupations),

(d) qualification analysis at the level of society as a whole.

The UK engages in all of these methods to some degree and the nations of the UK have different agencies for some of the tasks. There is an infrastructure of organisations including the Learning and Skills Councils, The Skills for Business Partnership (which includes the Sector Skills Development Agency (SSDA) and a series of Sector Skills Councils (SSCs)) that works with specific occupational groups to ascertain skills needs. The work of these bodies is supplemented with analyses from specialist researchers in universities and other expert centres. The UK government commissions research on, for example, how occupations might change in the future.

Experts charged with carrying out reviews of qualifications are invariably asked to look to the future; the importance of developing highly skilled people to guarantee the future productivity of the UK is usually emphasised. However, the practice of producing future-oriented qualifications is highly problematic.

3. How are qualifications modernised in the UK?

There is no generic needs analysis process that is applied to all qualifications in the UK. Until recently the 'refreshment' of qualifications varied according to the type of qualification. Occupational qualifications have, for many years, been continuously developed to meet better the needs of users; the market for qualifications has been the main force for change. However, in the late 1980s wholesale rationalisation followed a review of occupational qualifications (Department of Education and Science and the Manpower Services Commission, 1986). This review was needed because qualifications had developed in diverse ways and the qualifications system had become very complex. Today, occupational qualifications are developed sector by sector. The Qualifications and Curriculum Authority's (QCA) ⁽¹⁾ accreditation programme, coupled with the establishment of an explicit national qualifications framework (NQF), has begun to set up a common system and timescale to revisions of all types of qualifications.

The system of developing occupational qualifications begins with the development of National Occupational Standards (NOS). Industry experts analysing occupations in their sector produce these industry standards. This

⁽¹⁾ QCA is a government agency that regulates qualifications by scrutinising them against criteria. If a qualification meets QCA's criteria it is accredited and is admitted to the National Qualifications Framework.

is generally followed by functional analysis that defines the competence that needs to be demonstrated in each job type within the occupation; currently over 90 % of the UK workforce is covered by NOS. These competences form the standards that are used to build qualifications. National Vocational Qualifications (NVQs) use them as building blocks, other vocational qualifications need to have demonstrable links with the standards if they are to be accredited by QCA and admitted to the NQF. There are currently about 700 NVQs and nearly 2000 other vocational qualifications.

4. Looking forwards not backwards

Official mention of building qualifications for the future comes in a 1995 statement from the National Council for Vocational Qualifications (NCVQ, 1995): 'The analysis should go beyond simple reflection of existing practice. It should address and incorporate predicted future occupational needs and practices so as to permit the skills base of the UK workforce to be updated and upgraded.'

A major review carried out by NCVQ/SCOTVEC in 1996 (Beaumont, 1996) did not address the future skills issue. This is surprising since one of the characteristics of NOS is: 'Ensure that the competence is broad enough to give flexibility in employment and be capable of adaptation to meet new and emerging occupational patterns.'

It was not until a statement from QCA (1999) that NOS were explicitly required to 'take account of the future needs of the sector', through:

- (a) taking account of technology currently used within the sector;
- (b) encouraging consideration of the sector's anticipated needs;
- (c) using innovative ways of capturing the views and needs of the sector.

However methods of achieving this were not specified.

A research report produced for QCA (Green and Hartley, 1999) concludes: 'In order for future needs to be seen as a priority and to become embedded into the process and outcomes from the development of National Occupational Standards, QCA needs to:

- ensure that preferred tools, methods and processes are clearly identified, have been tested and shown to work, be valuable across a variety of sectors and become part of the funding criteria for the acceptance of tender documents and outcomes from standards and qualification development projects;
- develop guidance notes to accompany the tools, methods and processes;
- market the value of capturing future requirements to industry bodies,

especially in demonstrating how future needs of the sector when captured can be reflected in National Occupational Standards that people currently working in the sector can use.'

More evidence of the difficulty of identifying future qualifications needs emerged from a recent QCA-commissioned pilot study (Green and Hartley, 2000) that investigated the range of techniques used by consultants to identify qualification needs in different occupations. The results were generally disappointing for those who expected to see forward-looking analyses. Many projects only seemed to pay lip service to future-proofing qualifications. Evidence showed that a variety of techniques (see annex 1) were used to determine the competences to be included in the NOS and that there was little consistency in the use of these techniques.

The government has recognised that accurately identifying future skills and qualifications needs is fraught with methodological problems. For example, the National Skills Task Force (DfEE, 1999) ⁽²⁾, was asked to provide advice on such things as:

- (a) the likely changes in the longer term skill needs of the economy and the extent to which these needs will be met on the basis of existing trends;
- (b) how best to ensure that education and training respond effectively to needs identified.

Recent research carried out by Wilson on behalf of Cedefop (2001) states that while there has been a revival in interest in future skills forecasting, the methods used have focused on issues for employers and often do not attempt to collect quantitative data on future skill requirements. In the UK there are many agencies that collate and disseminate information about skills and qualifications needs; however, all this data gathering and processing still leaves a problem. The Skills Task Force (DfEE, 1999) extensively reviewed labour market and skills information available in the UK. It found: 'Despite the extraordinary volume of data, there was an almost unanimous opinion from those we consulted that there was too much data overall, that what there was was inconsistent and incoherent, and that it was primarily backward looking, and of little use in helping either individuals or providers make sound judgements on future labour market opportunities and demand.'

This situation has been reported widely elsewhere. Focusing on the issue of future skills, Haskel and Holt (1999) cite the lack of consistent quantitative information about past skills patterns as a reason why accurate forecasts cannot now be made at this level.

⁽²⁾ National Skills Task Force, 1999, chapter 7 'Informing the market – gaps in our current approach' P87 section 7.35.

5. Putting scenarios methods in the toolkit

There are changes in the UK that might lead to improvements in processes for identifying future skills and qualifications needs. The UK has recently restructured the sectoral bodies that play a major role in identifying skills and qualification needs, and a new Skills for Business Network is now in place. At the same time, another relatively new organisation called the Learning and Skills Council is establishing its role (nationally and regionally) in meeting skills needs and funding training schemes to meet these needs. In 2002 the programme that generates and refreshes NOS was reviewed. In the same year the development of background or underpinning knowledge for jobs received attention. A technical certificate has been developed that covers this knowledge and can be taught off-the-job. The technical certificates have been developed by industry experts and, interestingly; some consultants report that it was easier to build future-oriented requirements into these certificates than into the National Occupational Standards.

Within the QCA, procedures are being developed for encouraging a systematic identification of the need for a qualification. Reports across a range of sectors help to provide a perspective of how qualifications serve the sector as a whole. It is in this area that the QCA has been looking closely at the potential of scenario methodology for providing the long view of qualifications needs. Scenario methodology was first developed by businesses. Its use can be traced to the early seventies in the large oil companies when they were recoiling from the shock of the doubling of the price of crude oil (Shell, 2000): the planning methods in use at the time had failed to take account of such dynamic variables. ⁽³⁾ The methodology involves developing plausible scenarios for 10 or 20 years hence and testing strategies for achieving objectives in the context of these scenarios. The scenarios can be seen as a kind of lens or 'wind tunnel' through which to explore the potential and detail of different strategies. The methodology does not create a convergent tool that provides a best guess for a single, inevitable future. Nor does it provide a best possible strategic approach, and it is not a derivative of forecasting. It is fundamentally different from other strategic tools and is best used alongside them. The distinctiveness of scenarios lies in the way they tackle uncertainty, the richness of the data generated for discussion and the capacity to facilitate 'out of the box' thinking.

⁽³⁾ For the latest developments in this area see Buchan and Roberts (Financial Times, 21 Jan 2002).

Several applications of scenario methodology have been reported recently. These include the United Nations (1998), the European Commission (Bertrand et al., 1999) and the Organisation for Economic Cooperation and Development (OECD, 1999). Some countries have used scenario methodology to look specifically at development of educational systems, for example New Zealand (Ministry of Education, 2001). In the UK the Future Learning Unit (2001) has developed socioeconomic scenarios for 2020 that include education and training. The QCA has completed a joint project with the Institute of Education in London looking at the future of vocational education and training in the UK; this was part of a Europe-wide project (van Wieringen et al., 2001) commissioned by Cedefop and the ETF⁽⁴⁾.

Strategic planning based on scenario methodology is described in detail with a step-by-step guide to its application in a Cedefop publication, *Scenarios Toolkit* (Leney et al, forthcoming).

6. How can future scenarios help?

The QCA's research team has been working on the use of scenario methods in qualification needs analysis for the last three years. The first application was in the financial services sector where an element of scenario planning was included in a sector-led project that aimed to produce a map of qualifications that might be needed in 10 years time by the fast changing financial services industries. This application of the method was insufficiently systematic to instil confidence in potential users of the data generated. The second application is in the transport sector and is a more substantial application of the methodology than the first. Four 'meta scenarios' for the transport industry in the UK in 10 years time have been produced in consultation with industry experts. Additionally more industry specific scenarios for three specific industries (rail, road haulage, motor vehicle servicing and sales) have been produced (Leney and Mackinnon, 2002).

The transport sector formed a good context for this study because:

- (a) it suffers from skills shortages (e.g. in local authorities, rail middle managers);
- (b) it faces new national and EU regulatory requirements;

⁽⁴⁾ Cedefop: European Centre for the Development of Vocational Training, Thessaloniki, see: <http://www.trainingvillage.gr>, under 'Scenarios and Strategies'; ETF: European Training Foundation, Turin, see: <http://www.etf.eu.int>

- (c) it is influenced by international developments and some parts operate internationally;
- (d) it has occupations that are regarded as safety critical or safety significant - thus placing considerable importance on achieving defined levels of competence;
- (e) licensing is a requirement in a number of key occupations;
- (f) changes in the business environment have led to high dependency on outsourced services and consequential need for means to provide assurance about consistency of competence standards.

These features make forecasting qualifications needs using traditional methods difficult and, in such circumstances, research literature suggests scenarios methods can be helpful. The methods used to build scenarios and test their effectiveness in identifying future skills needs is described in a Cedefop publication, *Scenarios Toolkit* (Leney et al., forthcoming).

At the same time as developing scenarios, the project team conducted an exercise of forecasting skills and qualification needs using evidence from traditional methods of skills surveys and expert consultation. The team proved clearly that the use of scenarios added a new dimension to needs analysis and provided an extension to the timeframe of normal skills needs analysis exercises. Work with transport industry experts has proven to be useful in confirming that scenarios methodology provides a useful additional perspective to that provided by traditional methods of forecasting. The work also revealed what further needs to be done to facilitate the use of the method across industries.

Experts involved in the research explained that it was normal practice to use foresight exercises to identify future skills. Uncertainties about skills needs in a sector in the medium term (three to five years) were used to inform workforce planning reports, this work either formally or informally done, with the outcomes captured within the plans but with the processes not being documented. This traditional modelling and forecasting used in the industries tended, however, to lead to a single, constant direction of change. Scenarios were able to provide feedback models and highlight a range of far-sighted ideas about the future that stakeholders could use to advantage. A labour market economist who works closely with the sector said that there was no contradiction between using labour market forecasts and developing scenarios as part of anticipating future skills and qualifications needs. He stated that: 'The scenarios form a good complement to forecasts. Forecasting models tend to be based on the construction of patterns of behaviour, while scenarios can focus on changes in these patterns. The forecasting model tends to identify links, and describe them as much as

possible in a linear way. The scenarios are much less explicit and they may contain inconsistencies, but they can help to examine wider possibilities. You could run a forecasting model lots of times to look at different outcomes, but this would produce too much data to be useful – scenarios characterise changes in a way that is easier to understand. There are some clear outcomes that come through both methodologies, and this should produce interesting results.’

Other experts commented:

‘The exercise promotes more lateral thinking before you go on to plan.’

‘A lot of the major influences can be outside the parameters that we control.’

‘The scenarios would be useful for steering groups within the industry. They would help you keep ahead of the game.’

Some issues about the development and use of the scenarios were raised.

- (a) Which agencies should be involved in the development of the scenarios? Suggestions were for ‘people in a strategic role’, ‘thoughtful practitioners’, the consensus that the scenarios work called for ‘a well-informed audience’.
- (b) When and how should the scenarios be developed and used to achieve optimal benefit? Several interviewees expressed the view that a scenarios exercise was ‘best undertaken at an early stage in a skills or qualifications needs analysis’.
- (c) The industry specific scenarios were felt to be more appropriate and relevant – they needed to be written in simple, accessible language that clearly and concisely communicates the message to managers in the industry.
- (d) Some interviewees considered that a 10-year perspective was too long and others that it was too short.

Experts considered that there is a need for published guidance to enable sector representatives and groups involved in the development of qualifications to be able compile and use scenarios effectively. They suggested the publication needs to:

- (a) describe the scenarios approach;
- (b) highlight how scenarios should and could be used;
- (c) explain who should be responsible for the development and implementation of the scenarios, and why;
- (d) outline the use of scenarios in highlighting future issues that might affect skills needs and qualification development;
- (e) describe how the scenarios approach complements and supports traditional forecasting methods, indicating the differences that emerge from each and outlining how the scenarios approach can beneficially be

- used to identify future skills and inform qualifications development;
- (f) clearly indicate the added value of the approach for users.

In summary, the scenarios approach tested within this project was considered to be a useful way of capturing future ‘uncertainties’. The scenarios were considered plausible and incited much discussion about the implications of their content for future skills and qualifications needs. It was agreed that the scenarios, together with traditional forecasting, should serve the development of ‘durable’ qualifications well.

7. Is scenario methodology an answer?

There seem to be three main problems associated with modernisation of qualifications. The first is difficulty in obtaining unambiguous, dependable and detailed evidence of the need for change and the second is resistance or inertia to change within the stakeholder groups. A third is difficulty in managing an evolution from one qualifications model to another. How might scenario methods help with these problems?

7.1. Obtaining good quality evidence

The problem of evidence arises because forecast data gets less dependable as the period of the forecast is extended. Uncertainties grow and, consequentially, decisions are not easy to make with confidence. The production of scenarios centred on uncertainty can extend the value of forecasts and increase confidence in a limited range of outcomes. Scenarios also accommodate main areas of agreement among experts about what is likely to happen and what is not. This serves to raise the plausibility of the different futures.

In their work on transport scenarios for the UK in 2012, Leney and MacKinnon (2002) have also developed quantitative descriptions of futures to complement qualitative ones. This provides a richness of data types that offer a more secure common understanding of what each scenario means. This welding together of quantitative and qualitative data is another major strength of the scenario method.

In summary, data generated through scenario building and the testing of strategies seems to help overcome some significant data problems. However the need for good data sets describing current labour markets and work practices remains key.

7.2. Generating momentum for modernising qualifications

The process of developing scenarios requires the involvement of key experts at several stages, serves as an early warning system for change and predisposes some experts to the need to look carefully at options for modernisation. The building of scenarios has the potential to lower resistance to change among stakeholder groups because it involves these groups in early stages of the development process. However, the method goes further as a consultation and dissemination tool: the testing of new qualifications and qualifications frameworks against scenarios is proving to be a particularly powerful method for building consensus. It is the fact that the method generates models to which people can react that is important. Each scenario is a focus of attention that provides a language that stakeholders can share.

There is one aspect of scenario building work that is potentially helpful with this second problem, that is identifying the precise nature of the 'drivers' of specific proposals for change. There is no shortage of experts who are willing to express an opinion on how a qualification should develop, but few express opinions about how it will evolve. One reason for this might be that people worry about uncertain influences, such as technological developments. Another is the difficulty people seem to face in weighing up which influences will dominate in years to come. Some of these influences reinforce one another; others are in tension. Drivers of change do not exist in isolation. Lobby groups, public champions, legal instruments, financial backing and communication infrastructures may all be part of the driver anatomy. It is essential to consider the nature of these powerful influences on the qualification system to help experts decide which changes are likely to happen and which ones are not. Experience of the application of scenario methodology in several projects has shown that defining, as far as possible, the nature of drivers for change is an important and useful process.

7.3. Getting from here to there

The third problem is how to manage the transition from an existing qualification system to a new one. This remains difficult. It would be easy to place too much store on the consultative power of scenario method and conclude that it is likely to help with managing transitions. However experience to date shows that this is not likely to be the case. People do not easily understand scenario methodology until they have used it. It takes time to appreciate fully the strengths and weaknesses of the method and, often, managers do not have the time required.

8. Conclusions

Experience to date of using scenario methodology as a tool for identifying future qualifications needs is promising. There are signs that the method is practical, efficient and effective when used in the mainstream of methods. We need to provide practical guidance to stakeholders coming 'cold' to this new and challenging way of looking at the future and show them examples of how it adds value to current practices.

The issue of welding the scenarios method to other processes needs to be addressed. There is little research evidence that suggests particular combinations of methods are best suited to particular contexts. There is also a particular problem with engaging managers in the process of integrating the method into current strategic approaches.

The initiation of the QCA's research on scenario method originated through involvement in Cedefop's pilot work on Scenarios for VET in Europe. Already there have been three additional applications in different educational fields that have yielded useful and previously unobtainable perspectives on the future. The QCA is, therefore, grateful to Cedefop for the opportunity to research and learn in the project. It is also important that we continue to share experiences of applying the methodology in different ways that are suited to different contexts. This meeting provides an opportunity to do this and again will be pleased to receive commentary from experts from other countries.

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Annex 1

Techniques used by UK consultants in identifying future qualifications needs

- (a) Workshops with experts: half or day-long structured sessions with high levels of interaction between participants and a sharp task focus throughout.
- (b) Focus groups, discussion groups, working groups, sector expert groups, brain storming sessions: shorter sessions which cover specific issues to exploratory discussion.
- (c) Delphi methods: iteration of views by a structured method of engaging with experts.
- (d) Questionnaires: these can vary in length, depth, openness, mode of contact with the interviewer.
- (e) Interviews: taking the form of one to one interviews, small group or telephone interviews. Interviews can be heavily structured, semi structured or open.
- (f) Desk research: looking at reports, statistics, recruitment data and other company documentation.
- (g) Case studies: applying trend analysis to specific work groups to discover implications. This includes work place observations and HR practices.

ICT is playing a growing role in all of these methods. The lack of consistency in the way the techniques are used may signal a methodological problem in this area.

A network for identifying skill needs in Italy

Mario Gatti

*Institute for the Development of Workers' Vocational Training
(ISFOL), Italy*

A permanent national system for observing and forecasting skill and training needs is currently being set up in Italy. The aim is to provide updated information on skill and training needs and to identify links with short- and medium-term job forecasts via a computer-based system. The system's features will make it possible for players in the training field to take programming and forecasting initiatives that will bridge the gap between available skills and the skills needed by companies to ensure competitiveness. Information provided by the system will allow vocational education and training to steer supply towards labour market needs. In this way, it will contribute to a truly active labour market policy. The system is targeted to policymakers, companies, education and labour market practitioners, and families.

1. Introduction

It is often thought that analysis or anticipation of needs is a matter of research. This is not so: in fact it involves a range of activities that may differ widely in approach, goals, instruments, methods and results. There can be no general rule as to which is the best option. The choice of how to proceed depends on the information requested, the source of the request and the intended use of the findings.

Some of the parties involved have only a superficial knowledge of the problem and confuse the terms and concepts. Often they treat different terms as synonymous, for example:

- (a) analysis of training needs,
- (b) analysis of skill needs,
- (c) analysis of skills,
- (d) analysis of the demand for labour,
- (e) analysis of labour supply,
- (f) analysis of occupation needs.

In the same way, very different research approaches are often regarded as equivalent: for example 'identification', 'analysis' and 'anticipation' of needs. Identification is an activity in which the existing needs are observed and described, even if they are more or less explicit. Analysis goes into greater depth and may also highlight latent needs that are not yet clearly perceived. In this case the researcher, based on available instruments, identifies a possible need and interprets it in the light of personal analysis. Also different is anticipation, which makes assumptions as to future change (in the form of scenarios), maps out future developments and forecasts possible needs.

But apart from the need for terminological clarity, what determines the success or failure of an analysis of needs is the working procedure adopted. Since surveys on needs may be linked with a whole series of requests for information, the person conducting them must in turn consider certain questions:

- (a) for whom is the survey being carried out, what is its function, its role, its tasks?
- (b) why is the survey being conducted, for what purpose does the client intend to use the findings?
- (c) what needs to be surveyed to find the information or data being asked for?
- (d) how should the survey be conducted, what approach taken, what methodology adopted, what instruments used and what options preferred, given the wealth of possible data and the limitations on available human and financial resources?
- (e) where should the survey be conducted, in which sectors, in which territories, on what sample?

This is the procedure adopted in constructing the network of national surveys on skill and training needs in Italy.

2. The permanent national system for the observation of skill needs in Italy

The system was introduced by the Ministry of Labour and Social Policies as part of the institutional reforms in education, vocational education and the labour market. This project, included in the programme of the European Social Fund 2000-06, provides for the implementation of a 'permanent national system for the observation and forecasting of skill and training needs'. This is intended to underpin the coordination of policies on education and economic development.

Whether the challenge of economic globalisation is met hinges on the ability to compete at world level. This means that the core of the problem is the development of those human resources that will enable enterprises to compete. The aims are quality, flexibility, innovation and production efficiency. Appropriate human resources are only partially available, as shown by current imbalances between supply and demand in the labour market, which means that appropriate active labour policies need to be introduced. Training and education are a major tool of these policies if individuals are to acquire the qualities needed by enterprises. In order to plan and design training and education in line with the demands of the socioeconomic system, it is vital to identify and quantify the occupations and skills needed and to determine the sectors and localities in which they are needed.

The permanent system for observing and anticipating skill needs is seen as a clearinghouse generating a flow of qualitative, quantitative and forecasting information on the needs expressed by the economic system towards educational system. Based on that information, the educational system should identify and structure the more important needs. This will allow authorities to plan and design the measures needed to bring training and education provision up to date.

The current initiative involves ISFOL (the Institute for the Development of Workers' Vocational Training), with the task of preparing and managing the system. It also gives social partners (through bilateral bodies consisting jointly of representatives of employers and representatives of the work force) the task of conducting the national surveys whose findings are to be used in the system. Besides coordinating all the surveys, ISFOL is also committed to constructing an information system on an Internet platform to distribute the data compiled to the various categories of users. The project will be implemented in two phases:

- (i) verifying the feasibility of the initiative: 2000-03;
- (ii) verifying the sustainability of the initiative over time: 2004-06.

The first phase will end in December 2003 after bilateral bodies complete the first cycle of surveys and input their findings into the information system set up by ISFOL. The system is already operative in a prototype stage and contains, besides the information already produced by the bilateral bodies, short-term recruitment forecasts for all the occupations supplied by the Italian Union of Chambers of Trade, Industry and Crafts, as well as medium-term employment predictions based on econometric models designed by ISFOL. For each skill need identified, therefore, the system provides a description of characteristics required, a forecast of recruitment possibilities in the short term and a medium-term forecast of employment.

The second phase of the project starts with an analysis of strengths and critical points in the existing prototype information system and identifies proposed amendments to the project to ensure that it is effective, efficient and economically sustainable over time.

Since these are national surveys, the whole territory of Italy is covered. All production sectors are surveyed, although the sectors explored so far represent about 40 % of the total, with an employment base of approximately 45 % of the total number of people in employment.

3. The network information system

The archives in the system contain various kinds of information:

- (a) data on production sectors covering the current situation and the short- and medium-term outlook;
- (b) description of skill needs;
- (c) short-term recruitment forecasts for skill needs;
- (d) medium-term employment prospects for the occupational groups concerned by identified skill needs.

The link between the various types of information is based on official classifications:

- (a) of economic activities (national classification ATECO 91);
- (b) of occupations (international classification ISCO 88 and national classification ISTAT CPI 2001).

Assigning the codes for those classifications to the individual items of information in the system allows this information to be combined and cross-referenced. Thus, the classifications act as Cartesian axes, connecting all qualitative items of information and connecting qualitative items with quantitative information and forecasts.

Starting, for example, with economic activities, information can be obtained on:

- (a) a sector of economic activity,
- (b) medium-term economic trends for this sector,
- (c) skill needs in this sector.

Alternatively, starting with a description of sectoral skill needs, information can be obtained on:

- (a) skill needs having the same ISCO code;
- (b) skill needs having the same ISTAT code;
- (c) short-term recruitment forecasts;
- (d) medium-term employment prospects.

The system can also be used to obtain region or province-based information on the following aspects:

- (a) skill needs,
- (b) short-term recruitment forecasts,
- (c) medium-term employment prospects.

All types of information within the system can potentially be interlinked, which means that information can be matched according to users' requirements. Through the coding systems adopted, it is possible to navigate from one type of information to another. At present a prototype of the information system is operative on a website. So far access is confined to a restricted user group, but in the future it will be open to all.

The system architecture is based on a relational database with a latest-generation semantic search engine. This means that the database can be navigated by means of natural language interrogation. There are three modes of navigation: simple, expert and by territory. In the first two cases, the starting point may be either the sectors of economic activity or job classifications, and in the third case the starting point is to select the territory (region or province).

By using the search engine and entering a question, which can also be structured, the relevant documents can be identified, with a breakdown by source and the assignment of a relevancy rating.

4. Current and future prospects

A detailed analysis of what this project has achieved so far has identified both strengths and weaknesses.

One of its strengths is undoubtedly the way in which findings from different fields of experience have been brought together in a single site. Another is matching qualitative information on skill needs with quantitative and forecasting information on employment. A third is production and certification of the information by unions and employers. A fourth strength is the cooperation among all parties involved in the process of constructing the system of observation and prediction of the skill needs.

The weaknesses identified are:

- (a) a lack of homogeneity of the surveys inserted into the networked system;
- (b) a lack of consistency in the survey results, due to the fact that the surveys were not conducted within a common methodological framework;

- (c) the fact that the information available in the system is incomplete, because of the limited coverage of sectors of economic activity surveyed;
- (d) slow information production.

Based on these observations, work is now being done to identify changes needed to overcome the weaknesses. Without departing from the objectives that originally guided the design of the integrated system of permanent observation of skill needs, it has become apparent that certain measures are necessary in order to reinforce the structure.

The main possibilities identified are to:

- (a) define a standardised technical specification as a common methodological framework for the qualitative surveys;
- (b) reinforce the statistical classification by means of a manual drawn up by the Italian National Statistics Institute to provide a description of the mission and the main tasks of the occupations classified, to allow the coding of the skill needs surveyed;
- (c) prepare a dictionary of occupations to serve as an interface between current denominations of the needs surveyed and their statistical denominations;
- (d) define a standard procedure for the move from skill needs to training needs;
- (e) refine methods for medium-term occupation forecasts;
- (f) link the networked system with other systems operating in the fields of continuing training, certification, apprenticeship and labour market management.

Identifying interactions between global and local developments: the Observatory for the detection of skill and training needs in the Barcelona region

Jordi Planas

*Institute of Educational Sciences,
Autonomous University of Barcelona (ICE-UAB), Spain*

The project presented in this article ⁽¹⁾ defines the content and methods for identifying vocational training needs in the Barcelona region from a standpoint different from, and critical of, the 'technocratic' methods that have long dominated the monitoring of labour market and training trends. This project is linked with other international initiatives.

The theoretical framework is a skill-oriented adjustment model of the kind being used increasingly in human resource management at all levels by business, industry and government bodies.

The project's methodology takes into account both global and local developments and aims to create a permanent instrument for identifying and monitoring skill needs and skills availability in a given region. It uses a pragmatic approach of regulation and adjustment underpinned by partnerships.

⁽¹⁾ The project was commissioned by the Vocational Training Board of Barcelona, the GRET (*Grup de Recerca sobre Educació i Treball*) of the Autonomous University of Barcelona in an international partnership with Tom Leney (University of London and QCA) and Guy Ourliac (University of Toulouse and ARGOS) to develop an *ad hoc* methodology. Part of this document has been published by CEREC: Planas, J. et al., 2001.

1. Project objectives

Our society is becoming increasingly complex and the speed of change is accelerating. Consequently information, such as that concerning long-term skill requirements, is not entirely reliable. In addition, the structures of organisations concerned with information on the availability of, and demand for, education and training within a given territory, and their policies, are extremely complex.

It follows, therefore, that any instrument for detecting skill and training needs in a large urban area must be designed to reduce uncertainty and underpin decision-making, rather than offer ready-made solutions. The present project defines the content and methods for identifying vocational training needs in the Barcelona region from a standpoint different from, and critical of, the 'technocratic' methods that have long dominated the monitoring of labour market and training trends.

The objective of the project, which is linked with other international initiatives, is to create a system providing information on the demand for vocational training in the Barcelona region and the extent and quality of its provision. Its aim is to encourage debate as to who should participate and who should decide on vocational training matters. It should also provide suitable information and analysis for decision-making on how to develop vocational training.

The theoretical framework is a skill-oriented adjustment model of the kind used increasingly in human resource management at all levels by business, industry and government bodies, one of its underlying assumptions being that the labour market is skill-oriented. Skills can be acquired in different ways and at different periods in an individual's life. They change in the course of time and are governed by the requirements of technology and the organisation of production processes, which in turn are influenced by globalisation and by the particular environmental and historical features of a given territory. The process of adjusting workers' skills to the requirements of business and industry takes place in a market responsive to 'signals' such as certificates of competence. Skills are, however, becoming increasingly varied and cannot easily be captured in educational certificates. Some signals are especially important for a given territory or sector of industry where they are consequently more highly rated.

The project's methodology takes into account both global and local developments and aims to create a permanent instrument for identifying and monitoring skill needs and availability in a given region. It will use a pragmatic

approach of regulation and adjustment underpinned by partnerships.

The aims of this project are as follows:

- (a) to provide a system of quantitative and qualitative information concerning availability of and demand for vocational training in the Barcelona region that is linked to, or associated with, international initiatives;
- (b) to encourage discussion within decision-making bodies in VET and summarise the results;
- (c) to provide contrasting data and analyses for decision making about the development of vocational training.

2. Theoretical framework

The traditional, more 'technocratic' model of manpower forecasting has three main disadvantages:

- (a) inadequate information on training demand, which increases as the time horizon grows longer;
- (b) the fact that individuals do not choose training exclusively on the basis of market needs nor do they wish to do so;
- (c) the inability of the training and education systems to adapt to training types and time frames that firms prefer.

The proposal is for a skill-based adjustment model of the kind being used increasingly in human resource management at all levels by business, industry and government bodies. It is based on the following assumptions:

- (a) the labour market is currently oriented towards the skills of the labour force;
- (b) there are different means and occasions in an individual's life that could be more or less convenient and effective for attaining different types of skills;
- (c) skills are not acquired in a single training space, whether at school or otherwise, nor at a single period in an individual's life;
- (d) the skills needed to perform certain nominally stable jobs, such as that of waiter or secretary, alter fairly rapidly over time without regard to the cycles of an individual's working life;
- (e) the demand for skills is governed by the requirements of technology and the organisation of production processes, which in turn are increasingly influenced by globalisation and by the particular environmental and historical features of a given region;
- (f) adjusting worker skills to the requirements of business and industry takes place in a market, which is increasingly sensitive to 'signals' as to

- individual skill, where formal qualifications continue to be of great importance, especially as filters, but which is also influenced by other kinds of skill-related signals difficult to capture in a formal qualification;
- (g) regardless of their specialist denomination, formal qualifications also – some would say especially – testify to key skills such as learning or communication skills that are useful in a wide variety of fields, allow for greater job mobility and make employment more flexible by overcoming the rigidities of one-to-one correspondence of the formal qualification to the actual job requirements;
 - (h) a number of these signals carry particular weight in a given territory or sector of industry and thus take on special importance in the skills market.

The skill-based approach creates a positive link between initial training and lifelong learning, both in the course of a single occupational career or of one that is interrupted. It sees training as a form of accumulation (every skill is useful in building a career) and rejects the idea of training as a contingent activity.

The skill-based approach makes it possible to relate and recognise different types of training and skills acquired over the course of a person's working life. Far from viewing the three vocational training subsystems (formal, work-based and continuing) as being in competition, the skill-based approach makes it easier to relate them to one another. In fact, the technocratic approach places the three systems in a relationship of hierarchical dependence while the skill-based approach brings them together.

The skill-based approach is not so bold as to promise the ideal solution, in the form of specific training to meet perceived skill needs. It simply affirms that relationships can exist between social bodies and employers and those involved in providing training (trainers and training bodies) and that it can assist in realising overall strategies aimed at major adjustments. While less ambitious, this promise demands certain changes in mentality to view things from the standpoint of skills, with the agents participating in choosing strategies for adjustment between social training requirements and firms' skill requirements.

To summarise: the adjustment model expresses the response of firms to uncertainty in the face of technological change and the difficulties of long-term economic forecasting. Flexibility and competitiveness are necessary basic values.

3. Methodological criteria

Before going into specific detail on the various aspects of the methodology to be developed it is perhaps appropriate to define the methodological criteria underlying the proposal.

(a) **Setting the analysis squarely within evolving trends**

One of the principal challenges confronting those responsible for deciding on training needs is the time-shift between availability and demand. This is why the method needs to include a number of elements enabling future trends in terms of likely scenarios, including, on occasion, a region's existing development strategies.

(b) **Complexity should be reduced but distortion avoided**

Another obstacle to be overcome by decision-makers is the complex relationship between training and employment and the labour market.

Reducing this complexity does not, however, mean over-simplifying and distorting. Nor does it allow a crisis management approach, dealing with problems only when they become urgent. Whatever the case, reducing complexity is a methodological imperative. The frequently heard statement that 'It is all highly complex' merely serves as an excuse for not taking a decision or rejecting any solution as inadequate. Reducing the complexity of a process is an intermediate step in weighing up and opposing common directions.

(c) **Use the term vocational training in its most widely understood sense**

Regarding the labour market as skill-based implies that there is not just one solution to a training need and that one cannot identify vocational training exclusively in terms of one of its methods or subsystems. We must instead use the whole range available in order to choose the most appropriate model, considering factors such as time, target audience, firms' customs and practices, and so on.

Adopting at least one broader concept of vocational training can help to avoid falling into the trap of the closed approach, i.e. defending the point of view that there is a predefined, independent subsystem for each of the skills required.

(d) Construct a permanent system

Identifying training needs – the requirements of the local economy, of firms in general, for ensuring employment for young people, enabling unemployed adults to return to work etc. – is not possible if the search is conducted using a technocratic parameter such as we have defined. This complex subject makes it necessary to relate sociological, political and institutional factors of which we are not sufficiently informed and which change too rapidly; a quick decision cannot offer a pertinent and lasting solution.

The most suitable instrument, therefore, is a permanent system capable of reacting to changes in circumstances, problems, institutions, statistics and the like. Moreover, the continuity of such a system will also provide all those involved in conducting the analysis and taking decisions with the skills and experience necessary to take action in areas of complexity.

(e) Adopt a pragmatic approach to regulation/adjustment

Employment forecasts, whether for the market as a whole or for a particular sector of activity or geographical region, are dependent on a number of factors that limit the forecasting horizon to the shorter or medium term. The contents of future jobs, and hence the qualifications and skills needed to perform them, are similarly uncertain. Uncertainty as to numbers, nature and content of jobs increases.

Training systems often have to readjust to meet the needs of the economy, firms or populations. However, they also, especially at the initial training level, suffer from considerable inertia, limited scope for development and a limited ability to respond to new needs.

Decisions concerning training will frequently produce their effects after the time for which training needs have been forecast. By the time the 'regulated' vocational training system and the universities turn out the first batches of those with the supposedly widely sought-after qualifications, employers will already have taken on other workers or graduates with suitable substitute qualifications. Difficulties are aggravated when the system is so hidebound that it goes on 'producing' people with qualifications for which the market has little demand.

It would seem that any decision concerning vocational training solves one problem at the expense of creating another for the future, hence the need to devise a form of management for vocational training systems that is sufficiently adaptable to permit frequent corrective action.

Persons responsible for taking decisions for a given region, therefore, must be prepared constantly to review and revise their systems. Only an approach that combines knowledge of the situation and of likely

developments in the nearer and more distant future, alongside keen awareness of the impact of alternative policies, will enable needs to be met as they arise.

(f) Forge partnerships

Nowadays no institution, occupational or professional organisation or forecasting or planning body is in a position to determine training requirements on its own, regardless of time horizon. While none has all the facts at its disposal, each has some elements relevant to forecasting the general economic situation, growth in a given sector of industry, important changes, management of human resources, means of accessing jobs etc.

Available data, whether obtained from statistical sources, based on estimates or qualitative research, is widely scattered and diverse. Often the information is contradictory because statistics are out of date, estimates exaggerated or statements made by those who are too involved or influenced by the interests of firms, trainers, students etc. to be objective.

A system involving partnership or association should improve access to quantitative and qualitative labour market data.

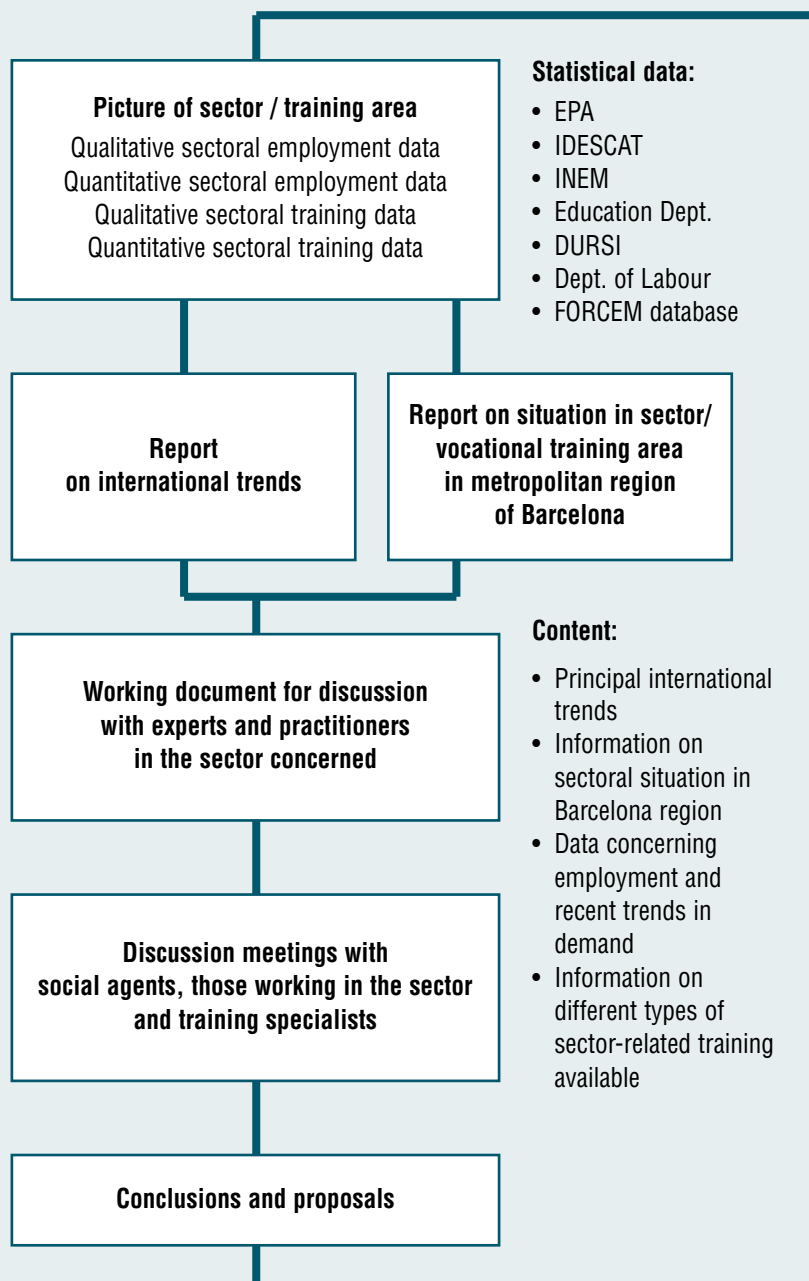
If it is to function well, this method will need to use secondary data to which access is guaranteed through a stable partnership network. Information concerning training and work generally comes from a variety of unconnected sources. Partnership will enable isolation and ignorance to be overcome.

(g) Equip those concerned with the necessary tools

With a complex approach of this kind it is not enough to find the necessary experts or partners for the task. They must be provided with the tools they need. No matter how skilled or willing the group is furnishing the data on which to base decisions, they will do better if they have the appropriate tools at their disposal. These will have various functions. First, they will be of symbolic importance in the sense that the partners will see that they are being taken seriously and that the client, where it is a local authority, is prepared to invest to strengthen their cooperation. That is to say, that this is not merely a case of 'nominal consultation' but of genuine collaboration.

Second, the tools will ensure a consistent methodological framework. If cooperation takes place in a clear and stable context one is more likely to be able to rely on collaboration from partners representing the various sectors concerned.

Third, they will constitute an important source of information, not simply by virtue of the information they generate but also because obtaining valid statistical information will ensure a focus on essential points and avoid

Figure 1. **Method diagram**

discussions on different perceptions of subject-matter for which objective data is available. The existence of statistical information restricts the scope for dogmatic generalisations that are often exaggerated and lead to time-wasting.

(h) Define the territory in terms of residence, training and employment

Defining a territory in which to ascertain the degree of match between skill requirements and available training means defining a territory that is closed in the sense of including the places of residence, employment and training for a stable population. In other words, the territory must include the bulk of those living in the area and working and undergoing training there.

(i) Define the areas of work/training (comparing availability and demand)

Two criteria must be applied when defining the work/training areas. The first is to identify them, as Guy Ourliac (in the third part of the publication by Planas et al., 2001) states, with the large body of knowledge and hence with the content of training and its associated tasks. The second is a pragmatic criterion linking the sources of statistical information under different headings. Combining the two criteria leads us to propose using the occupational families of the vocational training subsystems as the basis for defining training/work areas, working with relevant equivalencies and differences.

4. A proposal: 'glocal' European network for the identification of skill needs

The Barcelona experiment is not, of course, the only one to adopt a 'glocal' approach combining global sectoral trends in industry with specific local trends in skill and training requirements. The Barcelona project has already benefited from an international partnership with London and Toulouse.

Similar experiments are being conducted in other countries of the European Union with whom research problems, methods and experience are shared. We propose that whoever should or could do so, assist in the setting up a 'glocal European network for the identification of skill needs' linking the existing experiments in a network and setting up the relevant technical support systems.

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Transfer of pilot initiatives into policy and strategic implementation: perspectives from transition countries

David Parkes

European Institute of Education and Social Policy (EIESP), France

This contribution concentrates on the issues of policy transfer and strategy for transition countries in the reform of vocational education and training (VET) in accordance with new labour market requirements. There is a multiplicity of approaches to the identification of skill needs but no common/magic formula. Research outcomes and technical solutions, especially within a donor programme, are often part of a labour market package which itself may be part of a larger VET reform programme. For sustainability, policy priorities and strategic implementation require transparency, political will and organisational understanding. Technical solutions are necessary but not sufficient. In order to retain relevance to the technical issues, this article draws lessons from a review of senior (upper) secondary education in Uzbekistan (funded by the Asian Development Bank). The article includes a set of precepts for policy acceptance, transfer and implementation.

1. Introduction

The focus of this contribution is on issues of policy transfer and strategy for transition countries in different stages of review, renewal, reform or reconstruction. However, most of the messages apply equally to Member States and are consistent with, and complementary to, other keynote contributions in this publication. The complementarity between the analysis for transition countries and the relevance for Member States is particularly valid given that donor project terms of reference for transition countries, whether multi-national or bilateral, tend to reflect the current values and preoccupations of the donors (Gordon and Parkes, 1995) whether EU, World Bank or other.

Other contributions to this publication, mostly deal very adequately with methodologies, mechanisms and tools and reflect rather more technical than policy/strategy issues. This article concentrates on policy transfer, the importance of which is highlighted by the fact that there is a multiplicity of approaches to the identification of skill needs but no common/magic formula.

The article draws lessons from a project in a former Soviet Republic, namely a review of senior (upper) secondary education in Uzbekistan (funded by the Asian Development Bank) which is used here as a case study (Schmidt et al., 2001). The terms of reference of the project included requirements to review the relevance of college programmes to local market conditions; the capacity of colleges to respond to and anticipate local need and the development of effectiveness performance indicators.

For the broader picture of converting technical recommendations into policy and implementation, reference is made to reform projects and recent or current 'green' and white' policy papers for mainly vocational education and training (VET) and also general education in Uzbekistan (Ibid 2001), Bosnia and Herzegovina (Phare VET Programme, 1998–2002 and TAER Programme 2000-03), Moldova (Phare VET Programme 1998-99) and Turkey (MEDA Programme 2002-07). The concern is with macro agreements on overall policy and strategic implementation together with priorities and timescales for micro implementation. (To maintain the link with Member State preoccupations, the author simultaneously worked with the European Commission and with the education and Member States labour ministries in work on transparency of vocational qualifications to assist labour mobility in the EU).

2. Definitions

Policy and strategy components are built into many donor-funded VET reform projects by means of green and white papers. A green paper is a set of policy recommendations presented for consultation to key constituencies at a stage when amendments (minor or major) can be made. A white paper is agreed policy and strategy. It is a stage prior to implementation but it represents a commitment on what is politically, technically and organisationally feasible.

For VET green or white papers the labour market is both a separate and connected subsystem with the components (subsystems) of VET usually broadly divided among:

- (a) content: curriculum development, certification and qualifications; standards and assessment;
- (b) capacity: teacher and management development;
- (c) structure: harmonisation of legislation, finance, organisational structure;
- (d) institutional development: seen both as state/regional development and the evolving profile of the school(s)/college(s) in the face of reform initiatives.

These are equivalent to the building blocks itemised by the contribution of Sergio Corti from the European Commission. It is necessary to bundle these components into a policy framework accepted for local ownership as a context for policy change/transfer (responding to local community and employer needs).

Within reform programmes and project terms of reference, pilot initiatives on identifying skill needs are only a small part of a labour market component which needs to be articulated and sold, as part only of a larger policy package complementary to the four elements above. This articulation takes place at a number of reform stages: policy formulation (the options); policy determination (the decision); policy implementation (making it happen).

These stages are complicated not only by the normal complexities of national politics and structures but also by the values and criteria of international agencies and donors with different approaches, procedures, benchmarks and performance indicators. This last element changes constantly.

If we take, as examples, occupational standards in Uzbekistan and Turkey, funding responsibilities in Moldova, agreement between the Entities and among the cantons in Bosnia and Herzegovina, the dialogue between Francophone and Anglophone influences in the Magreb countries (Chakroun and Parkes, 2002) then for each and every one it is necessary to determine the usual questions of:

- (a) what is it?
- (b) what does it mean?
- (c) who does it?
- (d) what is the time scale and priority for renewal, reform and reconstruction?
- (e) who pays?

3. Precepts

This short (condensed) paper offers five (short) precepts necessary (if not quite sufficient) for policy acceptance, transfer and strategic implementation. A follow-up reference is given for each.

Grubb and Ryan (1999), examining the roles of evaluation for vocational education and training, point out that politicians are prone to ignore ‘the evidence’ whether of research, evaluation or demonstration. Establishing a policy framework (green or white paper agreed by the main actors in a country) with strategic recommendations has to take into account and work with the local political and policy drivers for reform or reconstruction. In the Uzbekistan case study, presented below, the evaluation of reform and the rationale for strategic implementation, however clear, (and agreed by external and local consultants) were not acceptable to central government agencies with quite different and overlapping personal, political and policy agendas.

Establishing consultant dialogue across cultures (again both internal and external) (Gadamer, 1981) is critically important. Research mechanisms, methods and procedures are necessary but not sufficient, i.e. they are all very well but often not understandable for local actors and often do not correspond to the specific culture. Technical outcomes are essential for strategic implementation but subordinate to process. For Uzbekistan, but also for the green and white paper mechanisms outlined above, to undertake a strategic review it is necessary to establish and develop a core group of strategic thinkers capable of collegiate thinking, outside and across narrow departmental boundaries, limited responsibilities and immediate career protection. Strategic implementation requires prioritisation of content and process alongside the physical construction of colleges and instrumental control. There needs to be a more comprehensive understanding of the inner logic of developing a VET system and a strategic partnership among the different actors to undertake the implementation; manifestly a need inside or outside the 15/25 Member States.

A strategic approach to change has to be accompanied by considerable insight from organisational theory and into change management (Drucker, 2001). Most donors and most terms of reference are woefully weak in these domains and set unrealistic timescales against (unsustainable) prospective outcomes and thus throw into doubt whole batteries of performance indicators and timescales established for measuring reform/project outcomes.

Reform processes need to start from an institutional logic which is country-specific. It is essential to start 'from where they are', not from where 'you want them to be' in terms of philosophy, policy, process, practice and procedures. (Parkes, 2003b). For the reform programme in Moldova to shift the qualification structure (via the Ministry of Education) it was necessary to negotiate with the Ministry of Economic Affairs to revise the definition of VET to include continuing VET and to shift the qualification-related ladder of salary levels. At least five ministries had to be involved in new VET legislation.

Labour market practices and VET reform are little understood by politicians and the public. This can be an advantage since experimentation and change can occur among professionals and in the shadows. General education is subject to considerable political and public attention and media glare (Green Paper, 2003). In Bosnia and Herzegovina the green/white papers for VET were accomplished quietly and in the shadow of cooperation with local actors; for general education the achievement of green/white papers was accompanied by the scrutiny of the local and international communities and the frequent intervention of all forms of media. It is infinitely easier to manage change in labour market and VET systems.

4. Case study: Uzbekistan

4.1. Introduction

The Government of the Republic of Uzbekistan and the Asian Development Bank agreed to this technical assistance (TA) project (TA3399-UZB) to support the Government (Interim) Review of the first phase of the National Programme for Personnel Training (NPPT). Commencing in July 2000 (and concluding in December 2001), the TA Project undertook a review of the management, effectiveness and efficiency of the senior secondary education (SSE) system (predominantly VET) in Uzbekistan. In addition to the substantive review of vocational education and training (VET), the project was to strengthen the monitoring and evaluation functions within the sector. The main conclusions of the project are summarised below, illustrating several factors:

- (a) that policy transfer (including initiatives in skill needs identification) has a much wider context; an overall reform package involves changes in component subsystems (labour market, mission, curriculum, standards, assessment, qualifications, finance, legislation and institutional development);

- (b) that policy transfer in one small area demands an overall conceptual and policy frame, negotiated and understood in common between local actors and external consultants;
- (c) that the personal, bureaucratic and cultural obstacles are considerable, especially to the strategic implementation of even commonly held goals;
- (d) that organisational change and the processes involved are barely understood by donors and external experts let alone the local actors.

4.2. Context

Uzbekistan stands apart from its Central Asian neighbours, and indeed the Former Soviet Union, in its adoption in 1997 of the National Programme for Personnel Training (NPPT). Uzbekistan chose to revitalise its vocational schools (PTU) and specialised secondary schools (Tekhnikum) by creating three-year professional colleges and academic lyceums.

With the benefit of hindsight, the reform relied on five major assumptions about the capacity of the Uzbekistan economy:

- (a) strong economic recovery would occur during 1997-2001;
- (b) there would be employment recovery in traditional sectors and occupational groups;
- (c) families could afford to support students attending a local professional college for three years without stipends;
- (d) a uniform professional college/academic lyceum model could be applied across all regions;
- (e) NPPT could be substantially implemented by 2005 from revenue generated by traditional sectors and employment during economic recovery.

The achievements of the national programme are even more remarkable because those assumptions were not fully realised. Subsequently, the Government's 2001 interim review extended NPPT implementation from 2005 to 2010. The longer period of transition caused by delayed economic recovery made the extension to 2010 inevitable. But the initial review could have gone further by adopting strategies to overcome problems of structural change in employment to include identifying currently changing local skill needs and anticipating future ones.

This did not happen because there was a dissonance between the policy (reform mission statement) of the President's office and the built in inertia and desire for status quo of the implementing ministries.

The technical assistance (TA) project was instructed to review implementation of NPPT at the college level. Project research confirmed fundamental problems in traditional employment sectors, in traditional

occupational classifications, in student aspirations for access to higher education, and in the cost efficiency of the system.

In-depth interviews of students, parents and employers in circa 50 case study colleges pointed to a need for urgent reform in labour market analysis, occupational classifications, college profiles and the curricula offered to students. Commissioned research in small and medium-size enterprises (SMEs) and joint-venture companies underlined the need for courses, which were more responsive to the emerging needs of employers in the labour market.

4.3. Main recommendations

The TA Project identified the need for six specific interventions (Schmidt, 2001, *ibid*). Each proposal sought to reinforce the underlying NPPT objectives to give Uzbekistan a skilled workforce to meet the challenges of the 21st Century.

4.3.1. *Strategy to meet labour market demand*

The Government should lead all ministries in an urgent examination of State classified qualifications, occupational skills required by employers and the range of courses colleges and lyceums should be offering to meet labour market demand. At a national level, a cross-ministerial commission should consult major employer groups and recommend action by government. The Presidential Office identified the specific issues of small and medium-size enterprises, and the TA advised that those needs should be included in the recommended strategy. However, a more appropriate strategy, perhaps, would have been to ensure that existing colleges and lyceums should have the skills, foresight and freedom to identify and respond to the labour market demand for more flexible but highly skilled workers.

4.3.2. *Responding to (local) market demand*

Changing labour market needs and college-based research (using student and employer perceptions of courses) required review/redesign of occupational classifiers so that college curricula might deliver the broader skills to meet changing demands.

Baseline research in the colleges revealed that fewer courses were offered in the production, construction and agriculture profiles and more courses in service, finance / economics and academic subjects. Given these trends for a more diverse range of colleges and lyceums, the centre should consult social partners, regional authorities and relevant ministries (labour, macroeconomy, finance) and recommend changes in qualifications, occupational classification and course curricula.

Monitoring of local employer views and student aspirations would ensure that the national system is more responsive to the changing economic situation. The SPOC/EPOC (student perception of courses/employer perception of courses) research methods were necessary to confirm that more immediate local needs could be matched in medium-term adjustments to the national curriculum.

4.3.3. *Flexible three-year curriculum models*

Implementing NPPT as a single curriculum model across all profiles, occupational groups and regions limited the operation of NPPT. A general/vocational course mix would allow progression from a common, general education curriculum in the first phase, to vocational orientation in a broad job-group (or job-family) in the second phase and delayed choice of final specialisation until the third phase. Allowing expansion of the colleges to a fourth year, provision of continuing VET modules and bridging modules between types of educational specialisation and levels would accommodate system need for flexibility and responsiveness to enterprises, providing students with choice, employees and the unemployed with possibilities for upgrading of qualifications and opening a perspective to lifelong learning.

In the medium-term, the strategic response should be towards a more coherent, flexible and broader educational response to economic and social change. Short-term modifications to NPPT by regional managers should be encouraged, supported and outcomes evaluated by the centre and the Government. At the same time, nation-wide needs for special provision of SSE to the economy and administration should be identified centrally and implemented locally.

4.3.4. *Broader curriculum choice*

Multiple-profile colleges would offer students more choice, plus guarantee viable course groups. Location, profiles, intakes and size of colleges should be determined by regions rather than by central government.

Unless restructuring occurred, small, under-resourced colleges would persist, often adjacent to other inefficient and ineffective colleges. Rationalisation of the profiling, structure and numbers of colleges would offer major savings in capital construction, savings in recurrent costs, and – more significantly – more scope for college/employer consultation about courses offered. Improved monitoring of outcomes should ensure that no student would be disadvantaged by the creation of larger colleges.

4.3.5. *Managing structural reform*

Centrally-determined curricula and staffing norms, enforced by decrees and orders reduced the capacity for VET to respond to economic change. The shift from control of inputs to monitoring and evaluation of student outcomes appears radical to the centre, but extensive visits to colleges in all regions indicated that it was being implemented locally.

The benefits of NPPT could only be realised if the Government provided the legal and administrative structure in which nationally-determined policy directions were implemented by regional and college managers. Increased local control over NPPT delivery required more effective monitoring and evaluation by regional managers. Improving reporting of outcomes (rather than reporting that planned input targets have been met) would give the Government an overview of system response to economic change.

Support for regional and college-based initiatives and development is also a question of training and experience. Targets for training were individuals, managers or teachers but according to the NPPT it is systems and institutions that needed to be changed. The present training system for NPPT staff should also focus change on institutions and deliver coaching and facilitation where needed at the colleges in the daily reality of service delivery.

The strategic response from Government should be to reduce curriculum, staffing and financial controls so that budget resources could be available to meet economic needs. Even with limited freedom in the use of budget funds, effective college directors were already responding to employer demands. Without greater flexibility in curriculum structures and a diverse range of services, most of the response was extra-budgetary, reducing both the relevance and efficiency of the budget sector.

4.3.6. *Improved efficiency*

Implementing the policy, employment, curriculum and managerial changes would protect investment in NPPT, provide graduates with the skills required by the economy and achieve a more efficient VET system. Compulsory curriculum hours, norms controlling use of teachers, practice masters and administrative/technical personnel should be reviewed, so that directors have more discretion over how the educational goals of students are best realised from available resources. The Government and the centre would need to initiate a review of current norms, and recommend options for medium-term change.

4.4. Case study conclusions

During periods of rapid economic growth, high employment and increasing government revenue, short-term structural inefficiency is to be expected. During periods of low growth, under-employment and low revenue, governments must act strategically to achieve the best outcomes from available resources. This requires a global managerial attitude to cost efficiency and a positive approach by government and central agencies to implementing structural change. But, of course, it did not happen that way.

In Uzbekistan the market was and is changing. EPOC and SME analysis amply demonstrated that the labour market varies by occupational sector and by locality. The TACIS VET programmes and a European Training Foundation (ETF) project to identify key occupations of the new economies developed appropriate tools and mechanisms. Consequently a combination was required of local labour market analysis and the capacity for flexible college response. This also required a shift in strategic implementation towards the following issues:

- (a) the determination and monitoring of the occupational 'classifier' required methodological review;
- (b) central labour market forecasting was not reliable;
- (c) social partner regulations were not applied;
- (d) qualification criteria were not precise;
- (e) educational standards and curricular norms were too rigid and rigidly applied.

For Uzbekistan, the success of the National Reform in improved responsiveness to local markets depends on understanding, adapting and implementing these changes in the philosophy and organisation of the curriculum rather than attempting a reform based on the structures of the old system.

Consequently, the reformed system was in danger of being outdated before it was implemented. Classification, standards, curricula, college profiles, teachers allocations and qualifications, equipment and physical criteria should reflect the needs of a society in transition to a market economy, a key characteristic of which is change on all levels. The prevailing management style (input management and centrally issued norms issued by bodies with limited conceptual grasp and management capacities) is a major obstacle to change in the system.

The broad philosophy of upper secondary reform in Uzbekistan was consistent with OECD benchmarks. But Senior Secondary Education programme offerings and priorities lacked consistency in their implementation. The policy framework for upper secondary reform required a

review of strategic implementation (rather than the broad mission) in particular to ensure that there should be a review of the relations and priorities among the building blocks of the reform. In short, the implementing ministries knew what to do but not how to do it and with often conflicting agendas, databases and priorities.

Managing change requires conceptual and policy awareness, and political commitment and a lengthy period of time. It requires consensus across government departments and agencies rather than dispersed responsibilities among different ministries and agencies. There is the need for a political voice or voices to make politically coherent the case for the consolidation of what has been gained and for developing management and organisational capacity in education and training. There are two aspects to change and development; the curriculum and pedagogic perspective, and the policy and strategy perspective. They need to be in harmony.

Most central bureaucracies value the status quo and resist change. The evidence derived from the local level indicated that local market conditions were changing, that colleges were responding with changed profiles but capacity for response was restricted by central failure to address many of the issues outlined above.

5. Overall conclusions

‘How do education systems change and what are the driving forces behind change processes? Even if we get right the description and understanding of the constituent building blocks that make up sector assessments, it is not sure that we have established the capacity to prognosticate change or to formulate the right intervention strategies to achieve it. Sector analyses are (normally) undertaken to develop quality, relevance and productivity in education systems or sub systems (the mantra of many terms of reference or TOR). They lead to policy proposals and reform designs with a view to changing practice on the ground. However, we have to ask what factors (empirically and theoretically) are brought to bear in an assessment concerning the dynamic forces, catalysts for change, etc., and in determining the ‘right’ balance between top-down (politics) and bottom-up (market) approaches? A strategic approach has to be accompanied by a deeper insight into organisational and institutional processes of change. Most donor terms of reference are driven by strategic political/policy objectives and somewhat mechanistic implementation requirements rather than the change logic of how to get from here to there.’ (Parkes, 2003b, *ibid*).

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Good practice and different practice: examples of approaches and transfer to policy and practice

Summary and conclusions

Eleonora Waltraud Schmid

European Centre for the Development of Vocational Training (Cedefop)

How can we identify, monitor and anticipate new and changing skill needs in European countries?

How can we transfer the results of these initiatives to policy and practice? Are political and practical responses relevant? How can we ensure that politicians do not just pay lip service to the findings but take appropriate action?

How can we cooperate and exchange information across countries to foster innovation and promote the transfer of good research and implementation practice across borders?

These were the questions provided at the outset to be discussed in the workshop. The workshop drew on experience of skills anticipation projects and initiatives which had been carried out in different Member States and countries in transition ⁽¹⁾. An equally important issue was the transfer of findings into policy and practice. The participants raised a wide range of issues, from forecasting methodology, project design and management, positions of politicians *vis-à-vis* the forecasts to the challenges at implementation level. The aim of this report is to synthesise the main issues raised.

The future is uncertain, but for policy goals and for implementation into practice we try to make it as certain as possible. Also, vocational education and training (VET), which is to prepare learners for the world of work, has

⁽¹⁾ See contributions in this volume by Nieuwenhuis, Strietska-Ilina, Coles, Gatti, Planas, and Parkes, presented at the workshop.

traditionally been designed for certainty. But competences for work, i.e. those needed to solve problems and to cope with a range of different work situations, become more and more unpredictable due to rapidly changing job requirements. Conventional forecasts anticipating future skills needs can reduce uncertainty to some extent, but we should not rely on them alone. Data might be poor, ambiguous, inconsistent and incoherent and/or mainly backward looking. Hence, whatever the level for skill needs identification, regional, sectoral, or occupational, a holistic approach seems more adequate for achieving higher validity and reliability. This approach includes qualitative (e.g. case studies, modelling, focus groups, Delphi) as well as quantitative data (e.g. extrapolation, surveys, skills audits, econometric models).

In countries in transition, traditional territorial forecasting methods are insufficient; the economy changes too rapidly. Education and training is often still highly specialised with narrowly defined occupational profiles and training programmes. These countries were accustomed to applying a technical approach to manpower policy which is no longer appropriate. With their institutions dissolved and the know-how missing, they need to find new methods to anticipate their skill and competence needs. Shopping around for expertise in other countries, also learning from failures both at national and international level, is a way of dealing with this challenge. It is thus important to establish a consultant dialogue across the cultures. Research mechanisms, methods and procedures are necessary, but not sufficient. Start where a country is, is the motto that should apply for any country, but even more so for countries in transition. Philosophy, policy, process, practice and procedures and institutional logic are country-specific. The next step is to reflect on where they want their economies to be, articulate their economic vision, decide on the sectors they would like to develop and take action, i.e. build a manpower policy accordingly.

A strategic approach supported by insight into organisational theory and change management seems important. Transferring one single approach from another country and/or setting unrealistic time scales and unsustainable prospective outcomes has proved counterproductive. Combining approaches from different countries and adjusting them accordingly to fit in the country-specific context, is a way forward and can also constitute the first step to cross-country cooperation.

An important point is to take into account both the specific local context and the global developments that influence competence and training needs. Skills shortage analyses can reveal a variety of aspects to be considered: e.g. a simple lack of applicants, deficiency in their quality or the more complex issue of skills shortages, such as considerable job vacancies

coinciding with high unemployment within the same region. Long distances to work, the low quality of the jobs on offer or the bad image of a certain sector can constitute major barriers to filling vacancies. As illustrated in examples from the Czech Republic and Catalunya, suitably qualified people are often unwilling to accept these posts. These examples show that skills anticipation as such does not solve the problem. It is necessary to describe the skills required for specific occupations appropriately and to explain in what way they are expected to change. It is also important to inform potential applicants how job conditions will develop (e.g. esteem, working conditions, pay). Last but not least, the solution often remains within the world of work rather than in the realm of researchers.

Information systems are currently being developed that combine quantitative and qualitative information. Incoherent data can prove a challenge. Scenario techniques make it possible to deal with incoherent data supply and to extend the life of the data. Identifying trends, looking for uncertainties, building scenarios, identifying and testing strategies, using evidence to consider future action, reviewing scenarios and strategies: these are the elements of the scenario method. Stakeholders need to understand what drives change; they require a language to talk about the future. The scenario building process generates strategic conversation which helps to perceive an (uncertain) future. The technical outcomes, i.e. the scenarios generated, though essential for strategic implementation, are often subordinate to this process.

Irrespective of their format, and the level they are based on (occupational, sectoral or regional needs), successful information systems seem to share a characteristic feature: they use a combination of different methods (e.g. good data plus good forecasting plus scenarios, traditional methods, complementary information, trends, vacancy statistics), comprise a number of building blocks and are linked to other initiatives. For the design of VET programmes, for instance, skill needs identification is only a small element, which in itself is part of a larger policy package. Although the labour market is a separate subsystem it is closely connected with the different components of VET: content (curriculum, qualifications, assessment etc), capacity (e.g. teacher development), structure (legislation, organisational structure, funding) and institutional development. Data on success of graduates in the labour market should also feed into the policy development process. In order to achieve a policy change, it is necessary to bundle the different components into a policy framework that fulfils the criterion of local ownership (e.g. in form of a green paper, policy recommendations for consultation among the key players, and a white paper of agreed policy, i.e. a commitment

on what is politically, technically and organisationally feasible).

Resistance to change within stakeholder groups is one of the main challenges. Irrespective of the methods used, it is crucial to involve all actors/stakeholders (e.g. social partners, VET establishments) as early as possible in the process. By actively participating they will recognise that there is not just one solution to the problem. Identifying the challenges is not enough. Once all the data and information are available, it is important to 'sell' the findings in an appropriate way. Using a variety of methods, e.g. on-line information systems accessible to everyone, and different types of networks can help disseminate the results among a wider audience but in a target-group specific way. However, research results are often presented in a language only comprehensible to experts. To convince the decision makers and other players it is important they understand the findings. Hence, it is necessary to convert the scientific jargon into a language that politicians and a wider public – and in particular the individuals concerned – can understand.

Policy thinking usually works in a linear way: think, design, implement, execute and, sometimes, evaluate. And politicians largely ignore the evidence, be it research, evaluation or demonstration. They want to have their own views confirmed. They tend to believe in scenarios or forecasts that fit best into their policies. But wrong assumptions, linear thinking and fixed policies prevent the stakeholders from facing the evidence and acting accordingly.

Fixed and prescriptive policies are inadequate for preparing VET for the future. Training policies, based on certain outcomes, will have to be replaced by policies which focus on the quality of learning processes and learning skills of employees: work-related skills will gain importance over specific job requirements. Flexibility and diversity should be organised on all levels: flexible expertise of workers, flexible training supply of colleges, flexible regulations from government. Hence, what we need is a learning policy approach. And we have to admit uncertainty. An adaptive policy design is required with continuous adequate feedback loops, evaluation, reassessment and readjustments. Transfer and feedback phases need to be foreseen from the outset. This implies sharp actions for the near future and more open, fuzzy lines for the long term.

Drawing on the examples presented by the speakers and on the contributions of the participants, the workshop concluded that exchange of experience at international level could support the various initiatives and examples of successful practice of policy transfer at local or regional level. Learning from each other, analysing why certain approaches and methods have proved successful or unsuccessful in a particular environment or

situation could help avoid reinventing the wheels simultaneously in different countries or regions. 'Glocal' networks could foster the cooperation between local, regional, national, international, occupational, sectoral and other networks. At the same time networks across countries would provide important information and feedback to support the work at local level. Such networks could also help to ensure a common language, as different terminology and categorisation are currently posing a major challenge in cross-national discussion. The workshop participants suggested that Cedefop facilitate such a platform that would allow sharing know-how across Europe.

PART IV

Early identification of skill needs in selected sectors in Europe

This part is based on presentations and discussion at the workshop, moderated by Susanne Liane Schmidt and Bernd Dworschak (Fraunhofer IAO). This workshop addressed changing skill needs in selected key sectors in Europe. In particular it focused on results of initiatives in the tourism, hotel and catering industry, where new business fields and occupations are emerging. New services require new qualifications, and employees and companies need information on future skill needs to keep their employability and innovation capacity. The same is true of newly emerging and fast developing industries. Depending on the specific sector and the focus of research, the approaches and methods of early identification of skill needs vary to a significant extent. Thus, the workshop participants focused also on various methodological approaches and their outcomes for specific sectors and/or across them. A summary and conclusions of results of the workshop discussion is provided in the contribution of the workshop rapporteur Ralf Mytze, WZB, at the end of Part IV.

Contributions in Part IV

Lothar Abicht, Henriette Freikamp

**Keynote: Changing occupations:
early identification of skill developments in the tourism sector**

Sibylle Hermann

**How the service sector is moving from standardisation
to increasing complexity: an example from the hotel industry**

Olympia Kaminioti

**Designing a methodology for the identification
of skill needs in Greece**

Norbert Bromberger, Friedrich Hubert Esser

**Are infant industries evolving?
Selected trends in the motor vehicle sector**

Ralf Mytze

**Early identification of skill needs in selected sectors.
Summary and conclusions**

Changing occupations: early identification of skill developments in the tourism sector

Lothar Abicht, Henriette Freikamp

*Institute of Structural Policies and Economic Development (isw),
Germany*

The project ‘Determining trend qualifications as a basis for the early identification of qualification developments’, draws its findings from surveys of trendsetting companies in selected industries. One field of enquiry is the tourism sector, specifically what is known in Germany as *Touristik* ⁽¹⁾, as tourism creates more employment and demand for new skills than almost any other economic sector. This article presents developments and investigation findings on trend qualifications in tourism. Taking the social context as a starting point, we elucidate related changes in employee skills and qualifications, and describe and analyse the trend qualifications identified in two selected fields of activity: tour guiding and business travel organisation. The project is part of FreQueNz, the Early Identification initiative run by the German Federal Ministry of Education and Research (BMBF).

1. Introduction

Rapid scientific and technological advances are creating new demands on employees and necessitating dynamic skill developments. To keep pace with these demands, the Federal Ministry of Education and Research has launched the Early Identification of Qualification Needs initiative and called for implementation of an appropriate early warning system. The aim is to identify trends in skill needs as early as possible, particularly at the micro

⁽¹⁾ *Touristik* means staying far from a person's own residence for the reason of recovery, cure, education or training as well as to promote business connections. The sectors hotel and catering trade and the large sector of transport (bus, train, air-line) were not part of the analysis.

level of work practice. The project 'Determining trend qualifications as a basis for the early identification of qualification developments', is part of this initiative, which has been using the 'sector scouting' tool to examine various sectors since 1999. This article focuses on determining skill trends in tourism, particularly at intermediate skill level (Abicht et al., 2002).

2. Skill developments in tourism: field of enquiry and approach

2.1. 'Sector scouting': a tool for determining skill requirements at the micro level of individual enterprises

The qualitative surveys conducted by the authors on early identification of skill developments are based on the hypothesis that emerging qualifications – so-called trend qualifications (Abicht et al., 1999, p. 11 et seq.) – can be identified and described as soon as they begin to emerge. Trend qualifications describe training requirements which are often only just beginning to become visible, but which may herald strong rising demand. Such trend qualifications within the changing tourism sector were both subject and goal of this research project.

New skills or trend qualifications develop in the course of specific work processes, particularly within innovative technological, organisational and customer-oriented changes, i.e. at the micro level of enterprises. Against this background, the surveys within tourism targeted:

- (a) innovative enterprises, such as travel agencies;
- (b) key suppliers, such as booking and reservation software providers;
- (c) sector insiders and experts.

Trendsetting companies and key suppliers were specially selected and persuaded to participate in the project. The emergence of new skills in the trendsetting companies is almost a natural process: changes in employment areas and activities within the sector automatically call for new or adapted skills from employees. Since companies tend to express concern about the lack of suitably qualified workers rather than perceive the evolution of a new type of requirement, open dialogue between researchers and enterprises is a key factor in identifying trend qualifications. Describing and analysing the work process is more effective in tracking trend qualifications than traditional survey methods. Enterprises often only learn or recognise that their own activities are innovative and that they are themselves trendsetters when changing work processes are examined.

The underlying research approach (Abicht et al., 1999, p. 36 et seq.; Abicht and Bärwald, 2000, p. 45 et seq.) combines elements of rigorous logic with experience-based intuition. A strict methodical sequence involving various research levels eventually allows us to identify specific trend qualifications. Following the thought models of chaos theory, individual stages of the procedural model are understood as complex dynamic systems interacting in various ways. Specifically, these are:

- (a) social systems (e.g. that of the Federal Republic of Germany) as the top level investigated; analysis of expert knowledge and literature, especially regarding findings on trends and future research;
- (b) corporate systems (tourism companies in Germany) as components of the social system;
- (c) work systems (e.g. corporate departments such as sale and marketing of tourist products and services, etc.);
- (d) activity systems incorporating the occupational activities of people within a work system and the necessary qualifications, knowledge and skills. Fields of activity in the tourism sector include advising on and selling tourist products and tour guiding.

Work hypotheses on potentially skill-relevant trends are formed on the basis of investigations at social system level. The approach adopted for the subsequent empirical research in the enterprise (corporate systems) derives from the work hypotheses obtained.

Empirical research inside companies chiefly employs the 'sector scouting' method (Abicht and Bärwald, 2000). This tool, originating from market research and applied by the authors for the first time in educational and training research, mobilises employees with extensive insider knowledge and contacts within the surveyed sector. They should also be able independently to implement and document the empirical research in accordance with the procedural concept. These so-called 'sector scouts' are able to gather important details and nuances and to illuminate veiled connections in their direct talks with corporate partners. They can empathise with partners' ways of thinking and finally blend into the corporate 'scene' to determine trend qualifications.

Sector scouts cooperate with researchers who have long experience in analysing training needs in processing the empirical material gathered: description of the concrete trend qualifications found, identification of the theoretical foundations and justification from the perspective of larger social and sector-specific contexts.

2.2. Tourism: field of enquiry and approach

Tapping related content in tourism follows the procedural concept on determining potential trend qualifications. The object under investigation is approached systematically through specialist literature on leisure activities, tourism, wellness and other pertinent topics, hypotheses drawn from trend and future research, and evaluations of press publications and periodicals (BAT Germany 2002; DRV 2002; FUR 2003; IPK International 2002; Krupp 2002; WTO 2002).

The initial focus was on the following questions:

- (a) which areas are included in the term 'tourism', and might it be necessary to limit the field of enquiry?
- (b) what macrosocial trends influence tourism or the narrower field of enquiry?
- (c) what significance does tourism have for economic and labour market policy?

After these general questions had been answered, we moved on to more specific ones:

- (a) what are the main trends in tourism today?
- (b) who are the trendsetters?
- (c) what skills and qualifications can be found in tourism or the narrower field of enquiry?
- (d) what trend qualifications are already discernible?

Our main sector scout in the field of tourism has had many years of experience as a personnel trainer in the cosmetics industry. Her extensive contacts with tourism insiders proved an ideal channel through which to conduct successful research in this varied field of enquiry. She visited travel agents, tour organisers, hotels, travel companies, continuing training institutions, associations, etc. A total of 75 enterprises and experts were contacted during this phase. The most important training providers and most marked trends were soon identified. It became necessary to restrict the tourism field of enquiry to the area of *Touristik* (see footnote 1).

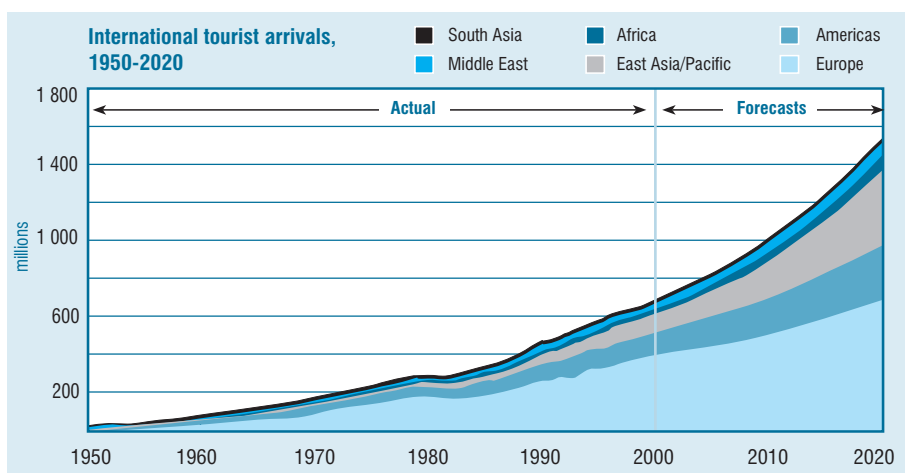
Limiting the empirical work to a smaller area of investigation made it more targeted. Overall we were able to persuade more than 30 trendsetting companies and experts to cooperate with us. We held several discussions and evaluated written offers. In several instances we were also able to observe work processes in action. Discussions were accompanied by continuing Internet-based research, analysis of daily newspapers and specialist journals and participation in conferences and trade fairs. The matured interim findings were discussed and verified in a sector-specific workshop involving corporate partners and experts.

3. The societal context and its impact on skill developments in the tourism sector

3.1. Socioeconomic context

Despite being shaken by recent scares and crises, tourism is still a growing sector (Figure 1). Research into trend qualifications in tourism revealed that development in this sector is primarily dictated by social trends such as changed leisure behaviour (Opaschowski 1997 and 2001), increasing individualisation, demographic trends (Statistisches Bundesamt Deutschland, 2002) and growing health awareness (Mühlhausen, 2000). These trends and their impact on the tourism industry are reflected in modified tourist products and services as well as in shifting occupational activities for people working in the sector.

Figure 1. **Development of the tourism sector to 2020. The most-frequent destinations will be Europe, East Asia and America.**



Source: World Tourist Organization (WTO)

One of the social trends affecting tourism is the boom in leisure time caused by the constant reduction of working hours. The average working day has fallen to between six and eight hours, and the working week to between 35 and 38 hours. The quality of free time, which was previously used for after-work relaxation or renewal of working energy, has been undergoing a value transformation since the early 1980s. Leisure time now, more than ever, provides space to satisfy the central human need to find purpose in life. The one-time *raison d'être*, one's job or occupation, now plays second fiddle to

family, friends and free time (Opaschowski, 1997, p. 259 et seq.). The elevated status of recreation has led to a shift in leisure patterns and to the growing commercialisation of free time. Leisure activities must be fun and provide that special 'buzz'. The tourism industry is also profiting from this focus on the 'experience'. Adventure and event holidays offer travellers more and more action, attractions, sensations and memorable experiences in shorter and shorter periods of time.

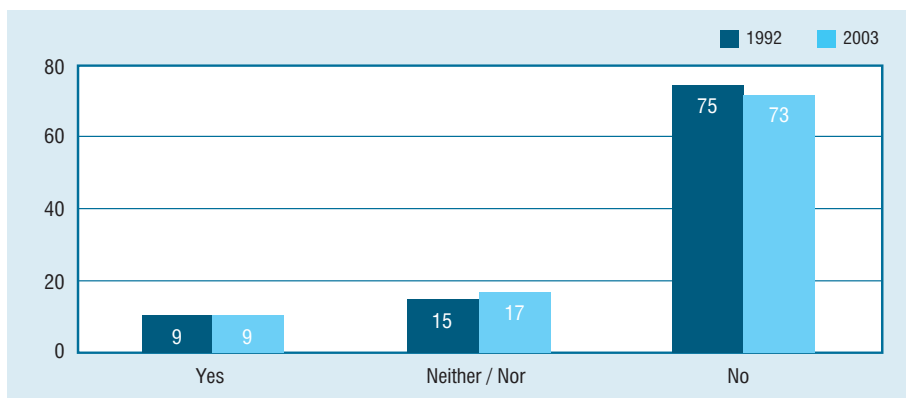
Heightened health awareness is another factor influencing leisure behaviour. We can regard aspiration to physical and mental health and wellbeing as the *leitmotif* of the 21st century. Health and wellness offers are, therefore, important topics in choosing leisure activities and selecting a tourism product. Another aspect is the ageing society. People want to enjoy their additional years and use them profitably and relatively independently. Taking responsibility for preserving one's health and increasing physical and spiritual wellbeing is one of the main reasons for the growing demand for tourist services. This explains the boom in wellness tourism.

The economic climate in Germany has also affected the move from 'well-off' to wellbeing tourism. The persistent recession, economic slump, mounting unemployment and a generally uncertain labour market conspire to raise cost consciousness. From the 1960s to the 1990s the prevailing tenet was that holidays were the last thing to cut back on. Germans – the world champions in travel – attached a great deal of importance to their vacations (Figure 2). Among consumer priorities, holidays embodying a better quality of life naturally ranked above cars as a status symbol (BAT Germany, 2002). Nowadays, as most Germans' finances are more limited, they prefer tourist products and services which, apart from being good value for money, also contain some sort of bonus. This may be a special wellness programme or the opportunity to develop personal or career-related skills.

Some people are currently eager to use their holiday or free time in general for further and continuing training. The increasingly blurred boundaries between work and leisure time and the growing significance of personal self-realisation are the main factors behind this trend. Tourist offers such as language and educational trips, cultural holidays, etc. are therefore on the increase. Single travellers with special interests often take advantage of such offers.

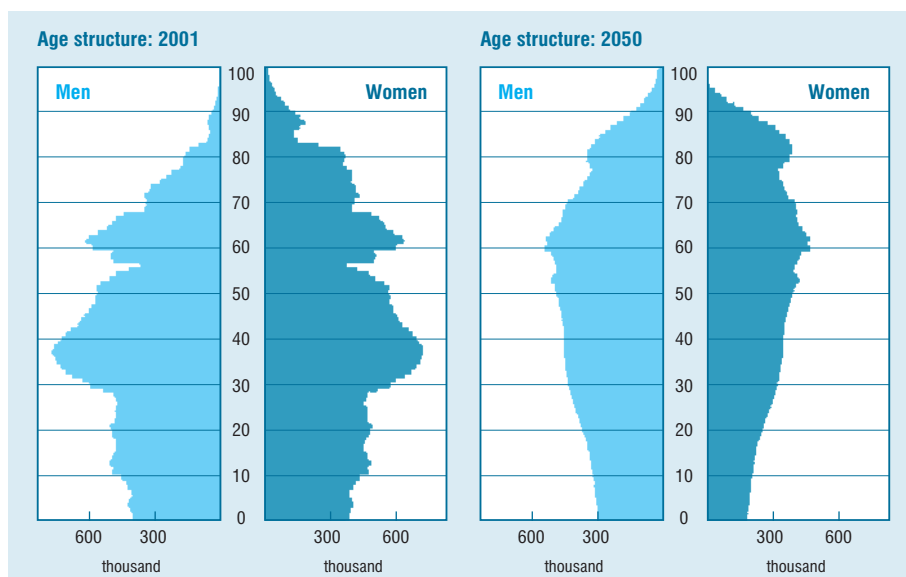
The increase in the number of single travellers, who form groups of like-minded people and become acquainted with foreign cultures, attend courses, learn languages, etc. by participating in theme-based holidays, is but one manifestation of the growing individualisation and pluralisation of lifestyles in our society. As a consequence, there is a rising demand for individually tailored tourist products and services.

Figure 2. **Travel analysis RA 2003**
‘Have travelled often, expect to travel less often in the future’



Source: F.U.R. (Forschungsgemeinschaft Urlaub und Reisen e.V.)

Figure 3. **Demographic development up to 2050 in Germany**



Source: Statistisches Bundesamt Deutschland (German Federal Office of Statistics) 2003

Another major factor determining tourist products and services is the demographic shift towards an older population. Pensioners and people whose mobility is restricted by age or disability form a constantly expanding target group. Furthermore, the age structure is expected to change significantly in the next 50 years. In Germany the number of working-age

people (20 to 59 years), now 45 million, will recede to just over 31 million by 2050. In contrast, the number of over-60s will rise from 18.8 million to more than 23 million (Figure 3). By 2050, 58 to 63-year-olds will be the most strongly represented age group (Statistisches Bundesamt Deutschland 2002). In this respect, too, tourism will have to tailor its range of services more and more to the wishes and needs of these groups.

3.2. General requirements for specialist staff

The trends outlined above do not only affect tourist products and services but also have an impact on the activities of employees in the field. The pace of change in tourism is constantly accelerating. New trends and new technologies, along with the growing requirements of an increasingly individualised clientele, are transforming demands on the sector's employees. Competition within the industry has become tougher. The main priorities for employees are now service- and customer-orientation, and increased professionalism.

According to our discussion partners, the tourism sector lacks adequately qualified specialist staff at intermediate skill level. Insufficient basic knowledge and skills in the area of tourist products and services, target areas, marketing, sales, customer-orientation, electronic data processing (EDP) and computerised booking and reservation systems constitute a persistent weakness. Staff also often lack interpersonal skills, particularly when advising customers or dealing with clients directly.

In addition to general and transversal skill needs, every individual segment surveyed – travel booking, travel design, tour guiding, business travel organisation and travel agent support – has its own skill requirements, corresponding to the various occupational areas.

3.3. Trend qualifications in tourism

After we divided our study into the individual areas of travel booking and travel design, tour guiding, business travel organisation and travel agent support, we attempted to delimit the scope of new activities and of related skill requirements. Overall, the investigation led to the formulation of nine complex skill packages:

- (a) travel designer, online travel agent and event designer in the area of travel booking and design;
- (b) tour guide for people with restricted mobility, *animateur* and expert on guest relations and service in the area of tour guiding;
- (c) business travel management expert in business trip organisation;
- (d) agency supervisor in travel agency support.

This article concentrates on the areas of tour guiding and business trip organisation. An in-depth description of all skill packages can be found in Abicht et al. (2002, p. 44 et seq.)

3.3.1. *Tour guiding*

Tour guides require increased specialist and social competences and interpersonal skills, particularly when the target group comprises older or disabled people. This target group needs a new form of tour guiding: they need people to provide intensive, continuous personal tour guiding from the planning stage right through to attendance of elderly travellers. Planning for this target group demands high levels of specialist knowledge and careful preparation, as spontaneity is not feasible. The group may need extra-wide doors for wheelchairs, ground-floor accommodation and/or user-friendly lifts. Tour guides must be constantly available to provide care and support, oversee special dietary requirements, contact doctors and/or pharmacists, interpret, look after luggage and take care of all other arrangements. They are also responsible for physiotherapy and entertainment. In the trendsetting companies surveyed, these tasks have been fulfilled by staff whose personal abilities and interests have equipped them with the necessary competence or who have acquired skills through experience or training. However, our project partners believe that performing services for this specific target group demands basic training, meaning not only elementary knowledge of destinations, tourist products and travel law but also medical and nursing skills.

More and more accompanied holidays are also being created for singles and for people travelling alone. Growing numbers of people are employed to occupy, entertain and communicate with such guests. The task of tour guides or on-site *animateurs* is to help guests get to know each other, make contacts, ensure guests have everything they need, provide entertainment, help guests overcome social inhibitions, encourage communication between holidaymakers, and motivate them to participate in a range of sport and leisure activities. According to our partners, these tasks are also currently being performed mainly by insufficiently qualified people from other professions, who tend to be highly motivated and communicative but lack relevant training. Specialist staff for this tourist service ought to have pedagogical and psychological qualifications as well as conceptual, theatrical, communication and sports skills.

Tour guiding encompasses the following four skill packages:

- (a) tour guides accompany organised tours and are responsible for providing information and organising the holiday on site at the destination. They

must be competent, knowledgeable and professional partners and advisors, providing background information on the destination. They offer guided tours, give travellers an accurate picture of the location and insider tips for trips, etc. They are responsible for clarifying issues regarding hotels, catering, medical care, travellers' money needs and events on site, and must ensure that travellers feel comfortable and well cared for;

- (b) tour guides for people with restricted mobility accompany and support travellers on trips outside their familiar environment, taking their limitations into consideration. They are responsible for providing information and organising the holiday on site at the destination;
- (c) *animateurs* work in hotels, holiday clubs and complexes and at sport and leisure centres. They act as contacts and entertainers for various groups. They often work in a team with other *animateurs*. In the areas of sport and fitness, fun and games, entertainment and shows, musicals, etc. they encourage tourists to participate in specially organised events, competitions, courses and similar activities, to get involved, have fun and enjoy themselves;
- (d) guest relations and service representatives are primarily employed by trade fair organisers or up-market hotels. They act as contacts or provide all-round care for hotel, wellness, spa, trade fair and business guests. Guest relations and service representatives support guests from the point of booking right up to daily and evening programmes.

3.3.2. *Business travel organisation*

Business travel forms a major segment of the tourism sector and is increasingly making new demands on responsible staff (Otto-Rieke, 2001). Growing numbers of larger companies are forming separate departments for organising and arranging business trips. The capability and knowledge required from the staff includes calculating expenses, handling company car fleets, contacting hotels, car hire services, airlines, railways, taxis and other providers. Employees involved with business travel focus on the strategic possibilities for optimising purchasing negotiations, planning processes and strategies, negotiating with service providers, reducing business travel costs and improving quality. They use Internet booking options, control car hire sales, check expenses, develop and monitor internal travel regulations, increase turnover in business travel, use mobile ticketing via credit card and mobile phones, etc. This area also suffers from a lack of qualified personnel. Companies have so far attempted to compensate for this with staff from other departments (e.g. control), but these employees often do not have the

comprehensive knowledge and skills necessary for organising and arranging company business trips.

Business travel management representatives are employed by a travel agent and plan, organise and calculate costs for business activities for individual clients and enterprises. Representatives compile appropriate tourist services for business trips and organise or supervise their implementation in consultation with the client or the responsible department. However, business travel management representatives can also be directly employed by a company, in which they establish business travel management as an independent and profitable function within the enterprise, elaborate principles for purchasing strategies, draft and monitor travel regulations for staff, buy good-value, high-quality tourist products and services, negotiate with tourist service providers (hotels, transport companies, hire car agencies, credit card companies, etc.) and generally reduce process costs for business trip planning, organisation, arrangement and calculation.

4. Conclusions and outlook

The research to identify trend qualifications in tourism resulted in a sector report, which contains short descriptions of skill packages as well as the findings. The skill packages have been elaborated, discussed and verified with the discussion partners. The descriptions only contain activity content and skill characteristics that are already discernible in trendsetting companies or which corporate discussion partners and experts have identified. They therefore do not claim to be complete or universally applicable.

The structure and division of the skill package presentations generally corresponds to the brief descriptions of occupational profiles which the German Federal Labour Office, among other institutions, employs ⁽²⁾.

We must reiterate that this form of presentation does not involve new occupations but concerns additional ideas or material to enliven discussion on existing initial and continuing training in the tourism sector. The available findings will help policymakers – particularly social partners – involved in tourism-related initial and continuing training to improve the training system and update occupational profiles.

⁽²⁾ Cf. the brief occupational descriptions at <http://berufenet.arbeitsamt.de>

Policymakers continue to be responsible for regulating discernible or anticipated skill needs by adapting existing initial and continuing training courses or creating new ones. These decisions must be negotiated with and settled by all relevant players.

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How the service sector is moving from standardisation to increasing complexity: an example from the hotel industry

Sibylle Hermann

*Fraunhofer Institute for Industrial Engineering (Fraunhofer IAO),
Germany*

We have been hearing for years that we are in the throes of change from an industrial to a service and knowledge society, and that, as the process advances, the demand for skills, qualifications and the means of obtaining them will become more stringent. According to a joint projection by the Institute for Employment Research (IAB) and Prognos, the period 1995 to 2010 will see the proportion of low-skill jobs fall from 20 % to 16 %, while those in the medium-skill category will remain more or less unchanged. In contrast, the share of those requiring higher qualifications will rise from 35 % to about 41 % (Dostal and Reinberg, 1999). However, forecasts and figures tell us little about reality. How will the change to a knowledge society come about in practice? What will it mean for firms and their employees? How will the changed situation and its requirements be dealt with? Little has been said on this subject so far. This article seeks to show, by reference to a specific case, how rapidly and radically job content, training and skill requirements can change for all concerned; not just for those in jobs calling for higher qualifications, but also in areas of activity not usually considered as requiring a considerable store of knowledge.

1. Introduction

We have been hearing for years that we are in the throes of change from an industrial to a service and knowledge society, and that, as the process advances, the demand for skills, qualifications and the means of obtaining them will become more pressing. According to a joint projection by the Institute for Employment Research (IAB) and Prognos, the proportion of less

skilled work, such as ancillary tasks in manufacturing, cleaning, or waiting in restaurants, will decline from 20 % in 1995 to 16 % by 2010. The proportion of medium-skill jobs, such as skilled jobs in manufacturing, skilled office work, and specialist product selling will hold more or less steady. But the proportion of jobs calling for higher qualifications such as executive posts, work in management and organisation or in research and development will rise from 35 % to 41 % over the same period (see Dostal and Reinberg, 1999).

Knowledge jobs today usually refer to knowledge management, i.e. persons expressly entrusted with gathering, filing and disseminating knowledge; or else to more academic activities, such as software development, engineering and research. If we look more closely at the transition to a knowledge society, it becomes clear that this process does not only affect certain occupational areas or professions; work requiring knowledge is to be found in almost every sector of business and industry (e.g. Hermann, 2002). How will the change to a knowledge society come about in practice? What will it mean for firms and their employees? How will the changed situation and its requirements be dealt with in practical terms? Little has been said on this subject so far. This article seeks to show, by reference to a specific case, how rapidly and radically job content, training and skill requirements can change for all concerned, not just for those in jobs calling for higher qualifications. It also points out that it is important to design knowledge-intensive work with lasting validity. We shall seek to demonstrate this with an example from a sector not usually considered as requiring a considerable store of knowledge, namely, the hotel industry.

2. An example drawn from practice

2.1. Stating the problem

One of Europe's major hotel chains is participating in a publicly funded joint project ⁽¹⁾ to determine the impact of working method innovations on the knowledge needed by its employees.

The project started from the realisation that, even in an enterprise whose products and processes were highly standardised, the ability to cope with knowledge was an important factor for success. Hotel service staff are repeatedly confronted with innovations that influence the way in which their work is organised and demand considerable skill on their part. Two recent

(1) The SIAM project (Strategies, instruments and work-organisation models for promoting service skills in firms) is being funded by the German Federal Ministry of Education and Research, project reference number 01HR9905.

examples were the introduction of a new reservation system that enabled a hotel to book rooms at other hotels within a chain, and the adoption of a new sales policy. Both came into effect almost simultaneously throughout Germany.

Management was anxious to discover how well the service staff concerned had coped with the innovations and what could be done to assist them with the transition. But it also wanted to find out in what ways employees' work had been affected, to be able to soften the impact of unforeseen side effects of such projects.

2.2. Procedure

Besides the thorough evaluation of the launch, which is customary in such cases, it was decided to conduct an analysis focusing particularly on changes in work allocation and the quality of skills required. Even at an early stage there had been signs that some employees' work was so radically altered by the new procedures that a short period of training would not be enough to help them adapt.

Hotels of different categories in two cities, Berlin and Frankfurt, were chosen and interviews held with reception and reservation clerks, managers and their deputies, and those appointed to the new posts of 'sales coordinator'. The interviews were evaluated by assembling all comments made regarding activities involved in 'room-selling' and then grading them according to the type of skill they required.

The entire procedure was conducted using the model of Quinn et al. (1996), who see genuine understanding as made up of four components:

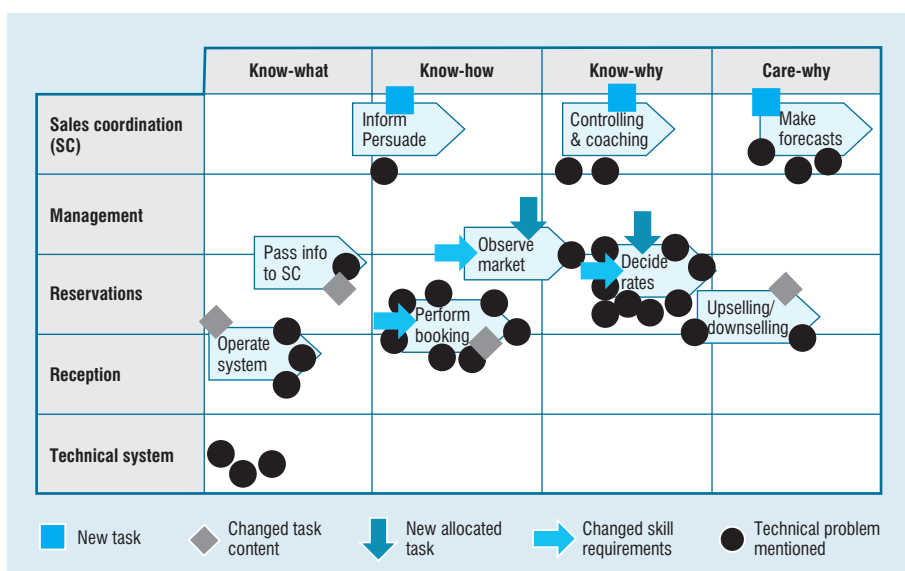
- (a) specialist knowledge, or 'know-what': knowledge needed for mastering a specialist field, acquired in the course of thorough training;
- (b) 'know-how': the ability to apply purely theoretical knowledge to complicated problems in day-to-day work;
- (c) understanding systems, or 'know-why': a sound grasp of the relationship between cause and effect coupled with a highly developed intuitive sense that equips experts for solving the most difficult problems;
- (d) self-driven creativity ('care-why'): ambition, motivation and sense of success.

2.3. Principal results

Figure 1 gives an overview of the results obtained using the method described. It shows the additional activities resulting from the two innovations: how job content radically changed; the level of skill now required for each of the activities; who in the hotels is now responsible for carrying them out; and what tasks should be regarded as difficult or problematical.

One gratifying discovery was that the launch had proceeded briskly and with far fewer technical hitches than had been anticipated, given the complexity of the system being introduced. It was also found that, thanks to thorough preparation and training in advance of the launch, employees adjusted rapidly to the new system.

Figure 1. **Principal tasks and their grading**



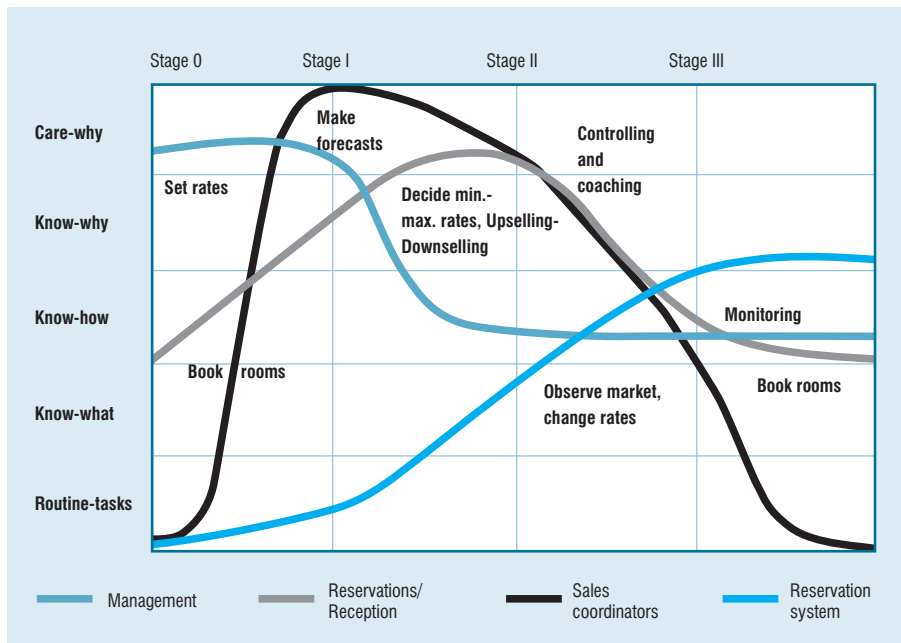
A second, more exciting, finding was the clear emergence of two new groups of knowledge workers within the firm. These were the sales coordinators – appointed to devise occupancy forecasting models for the various hotels and to advise hotel managers accordingly – and the reservation clerks.

That the first group was required to perform knowledge work was to be expected. What was surprising was the discovery that the two innovations combined had led to an entirely new occupational profile for reservation clerks. These employees were now called upon to make a series of complex decisions: When do I accept a guest's reservation, or when do I pass him on to another hotel? When do I offer a cheaper room rate? When do I refuse to go lower? How do I steer the sales process? What had been a simple call centre job had developed into a position of strategic importance, not just for the hotel employing the person concerned but for the entire area.

2.4. Outlook

The interviews also yielded a series of indications that the degree of knowledge and skills required for both types of job would decline again as routine set in, helped no doubt by another wave of automation (Figure 2).

Figure 2. **Expected future tasks and skill requirements**



We will illustrate this by referring to the knowledge and skills required for the reservation clerk job. Initially they must adjust to the increased demands of the job (Stage 0-II in Fig. 2). But what will happen once sales coordinators' forecasting models are translated into software and the functionalities of the reservation system are expanded? The system will simply reclaim some of the demanding new tasks (after stage II in Fig. 2).

Empowerment, however, cannot be taken back. More challenging work will now have to be found for the reservation clerks, not just to prevent frustration but also to allow the firm to derive maximum profit from investing in skill enhancement. So while initially the prime concern is to reduce the complexity of work, in the future it will become necessary to reverse the process and to increase complexity. Only then can the firm and its employees develop further.

3. Conclusion

This practical example shows that it is worthwhile seeking out knowledge jobs, even in places where they are at first thought unlikely to exist, and that an analysis of knowledge-intensive jobs can bring surprising insights. As far as skill and training requirements are concerned, the example demonstrates that service work is becoming more knowledge-intensive even in sectors and occupations where it is not yet performed by people with higher qualifications and skills. Marked changes in the nature of service work may even occur overnight in areas where less qualified people are employed. Standardising products and processes does not necessarily bring along reduced skill requirements. When it does succeed in making work routine it also raises the problem of how to ensure that employees do not lose their knowledge and skills. It is not only efficiency and productivity through standardisation that are desirable; for the firm, further development based on sound knowledge and (expensively acquired) skills is also important.

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Designing a methodology for the identification of skill needs in Greece

Olympia Kaminioti

*Employment Observatory Research – Informatics SA (PAEP),
Greece*

Progress in identification of skill needs in Greece has been slow. Some attempts at regional or occupational level have been ad hoc, concentrating mostly on mismatches between labour demand and supply and not so often on the content of the occupations and on specific skills and competences. The pressing need for reliable input for assessment and improvement of labour market and educational policies has recently brought some results, at least at the stage of designing a monitoring system for skill and competence supply and demand. The Employment Observatory has undertaken responsibility for designing a methodology for this purpose. The project relies on the experience of other countries, with the advantages and disadvantages of different approaches evaluated and adopted to the situation in Greece. The aim of the methodology is to estimate short-term labour supply and demand of the occupational and sectoral structure at regional level and the labour supply and demand of skills and competences corresponding to the previous structure. It is an ambitious project that requires the analysis of quantitative and qualitative information. The data that will be used include time-series data on the economy and the labour market available from the National Statistical Office and the Greek Manpower Employment Organisation and raw data that will be collected through company surveys and in-depth interviews.

1. Introduction

The identification of training and skill needs is essential for policy-makers in different fields including training and education, labour market and local administration. A better match between labour demand and supply in terms of qualifications, skills and competences is also beneficial for employed and unemployed people, for the future labour force, businesses, economy and society. Information on future skill needs helps vocational education and training to adapt to the real needs of the market (both current and future) and facilitates successful placement in the labour market. Early identification of skill needs can limit the time lag between recognising needs and adopting measures to meet them. It also improves the employability of both the employed and unemployed, lowering labour market mismatches created by the lack of correspondence between the labour market and education. Businesses can more easily find the employees that are best qualified for their operation and thus be more competitive. A better and up to date trained labour force provides a significant competitive advantage to the economy as a whole. Lowering mismatches between the education and training and the labour market helps lower unemployment and therefore lowers the risk of social exclusion for a number of people, providing an advantage for society as a whole.

Compared to many other European countries, Greece is at an initial stage of systematically assessing skill needs and identifying these needs at an early stage. Until recently, assessing skill needs in Greece was the subject of ad hoc studies which proved to be of limited value owing to restrictions such as requirement to produce results within a very short time, lack of data and resources to collect and analyse data, etc. Perhaps another reason for the delay in setting up a monitoring system for identifying skill needs is that usually these systems are strongly connected to training policies rather than educational policies and, in Greece, more emphasis was traditionally put on education than training, both at the institutional and the micro level. However, the initial resistance gave way to increasing realisation by many actors of the importance of early identification of skill needs, which helped overcome several obstacles and resulted in a project for monitoring training and skill needs. The project is designed and run by the Employment Observatory. This paper outlines the main methodological decisions adopted by the Employment Observatory for assessing training and skill needs in Greece.

2. Project description

The training and skill needs experiences of other countries – both with long experience and more recent ones – are of great value for our project. One of the starting tasks in the project was to assess the methods used in other countries and consider their adaptation to the Greek situation. In the process of selecting the most appropriate methodology for identifying training and skill needs for the Greek labour market several factors were considered. These include the lack of previous detailed estimates, methodological issues including the assessment of different methodologies used elsewhere, the availability of resources and the effort to produce results as soon as possible.

Considering these factors led us to adopt a combined approach and construct the project as a set of sub-projects which are designed separately but are considered as pieces of the same puzzle. Different types of methodologies and data sources are utilised in the sub-projects. Moreover, they have different starting points depending on funding and other factors.

The sub-projects are:

- (a) estimating sectoral and occupational labour demand and supply by educational level, nationally and regionally with an econometric model;
- (b) assessing competence and skill needs with an extensive business survey and in-depth interviews;
- (c) analysing secondary data from other sources and evaluating existing studies on training and skill needs at sectoral, occupational or geographical level;
- (d) developing occupational profiles for several occupations.

The structure of the project and the decision to combine different data sources and approaches are justified by the need to minimise the shortcomings of each individual data source or technique; this should produce a more holistic picture of the existing and developing skill structure.

The benefits of the holistic approach are clear when each individual technique is assessed. For example, forecasting models have been criticised for producing vague or not very accurate estimates. Their value depends on their design, the data quality and base assumptions. In our project a forecasting model is used to provide short-term estimates of occupational and sectoral demand and supply by educational level. The initial estimates will be assessed and the model will be redesigned accordingly.

While the first subproject focuses on the labour market structure, the second sub-project focuses on skill needs. It concentrates more on the private sector of the economy and less on the public sector. For this project

an extensive business survey was designed, extensive both in terms of sample size and information collected. The sample size includes 7 000 businesses. The criteria for the sample selection is the size of the business and the sectoral and geographical distribution of businesses in Greece. The quantitative data from the survey is supplemented with qualitative data collected through 80 in-depth interviews with business representatives and other relevant actors. Business surveys have also been criticised as instruments for assessing training and skill needs. These criticisms have been seriously taken into account in the design of the questionnaire and will also be taken into account in the interpretation of results. The in-depth interviews were added to counteract some of these criticisms and to ensure richer information on skill needs.

It was also considered useful to analyse other sources of data such as vacancy statistics and sectoral, occupational or educational data that were not used in any other part of the study. However, vacancy statistics should be used with caution. Certain types of vacancies exist for a long time. Does that mean that skills required for these professions are not easily found in the market? It rather means there is a mismatch between what is offered and what is demanded. It could be that salary and working conditions are not satisfactory in certain professions; there is a high turnover and they appear more often in vacancy statistics. These problems are mentioned in order to highlight the caution with which these statistics should be interpreted. Besides these difficulties, vacancy statistics and other data sources and specific studies can provide us with additional useful information about skill needs in specific sectors and occupations.

The final subproject focuses on the development of occupational profiles. Such occupational profiles do not formally exist in Greece for most occupations. The first aim of this subproject is to develop a common methodology for constructing occupational profiles and subsequently to create these profiles for a number of occupations. The profiles will include information on the possible educational and training paths leading to an occupation, tasks and responsibilities of the occupation, skills and competences required, in and out mobility and contractual arrangements. Small business surveys have been planned for the selection of data which will supplement existing secondary data on educational and labour market characteristics necessary to build each profile. Creating specific occupational profiles, and later on updating the relevant information, will provide a useful insight for the whole project.

3. Conclusions

The task of identifying skill needs is not easy. Early identification of these needs is even more challenging. The results of such an exercise are valuable for many actors. However, translating this analysis into appropriate policies is an even more difficult task. First, the right actions have to be decided, taking into account the results of the analysis and all other relevant factors (institutional and organisational characteristics, available resources for reconstruction, etc) and then appropriate changes have to be introduced. The stage of applying identification results into action is beyond the scope of this paper, but is mentioned in order to underline the difficulties of implementing these changes.

The importance of early identification of skill needs has been emphasised by many. It is clear that early identification of skill needs and the adaptation of educational and training systems to these needs can help minimise certain kinds of mismatches and, in this way, contribute to a better functioning labour market. However, it cannot prevent mismatches because the roots of mismatches lie in other locations, as well as in the training system. And no matter how good the identification systems and training systems we develop, if the number of available jobs is not sufficient, the Lisbon target 'to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion' cannot be achieved.

Are infant industries evolving? Selected trends in the motor vehicle sector

Norbert Bromberger, Friedrich Hubert Esser

*Research Institute for Vocational Education and Training
in the Crafts Sector at the University of Cologne (FBH), Germany*

Technological innovations are more than features of structural change. In SMEs, they also reveal the reality of modern economies and societies. The significance of knowledge management in SMEs has increased substantially: new industries do not generally emerge from scratch. Indeed, many traditional structures are now being transformed, as jobs, particularly in commercial and technical fields, expand to cover knowledge-oriented components.

In this context the early identification research of the German Employers' Organisation for Vocational Training (KWB) and the Research Institute for Vocational Education and Training in the Crafts Sector at the University of Cologne (FBH) has identified the following main trends in the German motor vehicle sector: 8 of the 10 most important future qualification subjects are cross-technological; measuring, tuning, analysing, researching, diagnosing and communicating are coming to the fore as expected competences; new information technologies, such as the Internet, are becoming an information platform for vehicle inspection, maintenance and repair; telediagnosis and garage networking are evolving into innovative services of the automotive trade and have a direct bearing on technological innovations in service centres and dealerships.

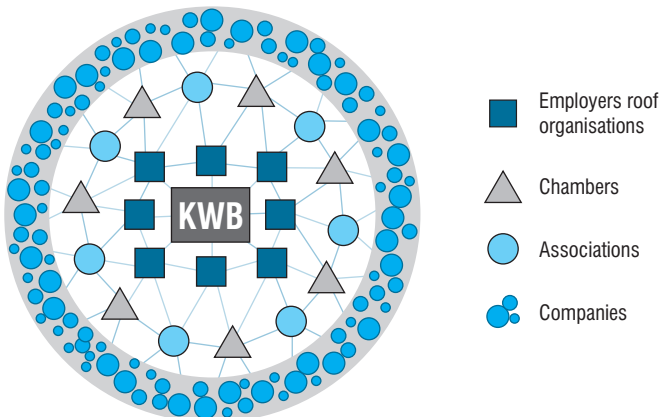
1. Introduction

Dynamic change in business requirements, reduction of the 'half-life' of knowledge and increasing skilled labour shortage are only three of the trends which are raising the demand for indicators of company skill needs in both established and so-called infant industries. The project 'Sector-specific information system for the skill development – making use of the business

sector networks' launched in May 2002, is geared to systematically using existing expert networks in private enterprises for future curriculum development in company training programmes ⁽¹⁾.

Early identification of company skill requirement trends is a key business strategy for sustaining competitiveness in the international arena. The goal of the procedure outlined in this article is systematic exploitation of the comprehensive expert networks in the business world to increase intelligence on qualification requirements. Business chambers and associations have several thousand experts who are in constant, direct contact with companies. This dense network can be tapped with a minimum of additional effort to reach both big and small business, and all scales between, on a regular basis. The German Employers' Organisation for Vocational Training (KWB), the organ of the top business organisations coordinating all reforms in initial and continuing training and new occupations, works closely and seamlessly with experts from chambers, associations, enterprises and educational institutions. Other business networks include the KWB training manager task force and the vocational training councils of the leading and trade associations and their training institutions. These are the results of the projects conducted by KWB in cooperation with FBH in early identification of skill requirements, and sponsored by the German Federal Ministry of Education and Research.

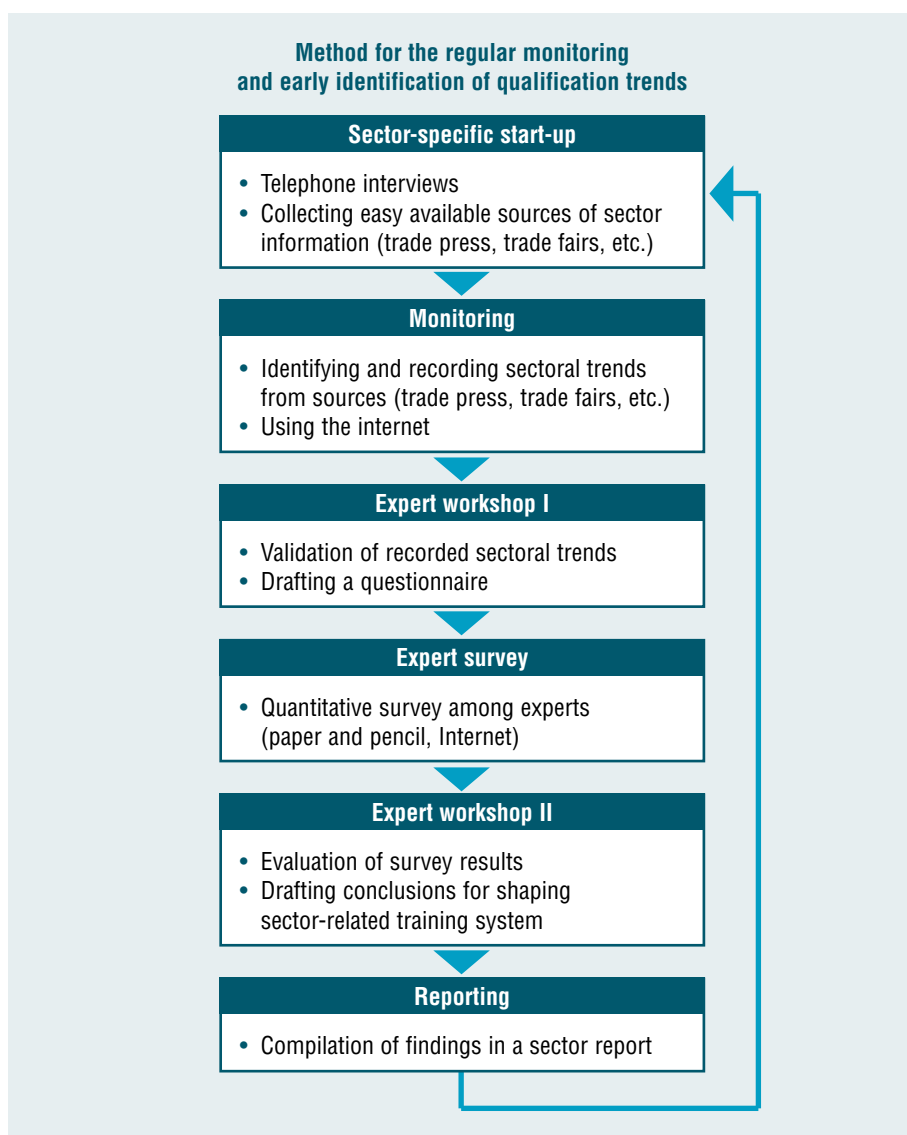
Figure 1. **Vocational Training Network of the German Business Sector**



⁽¹⁾ The cited KWB project is a follow-up to the 1998-2001 project on permanent monitoring of company qualification trends. Both KWB projects are components of the Research Network for Early Identification of Qualification Needs (FreQueNz) research focus of the Federal Ministry of Education and Research. Findings of the first KWB project are found in Diedrich-Fuhs et al. 2001, Bromberger and Diedrich-Fuhs 2003 and 2003a and Esser and Bromberger 2002.

In subsequent sections we will portray the method for regular monitoring and early identification of qualification trends (IDQ[®]) as a methodological approach to early identification of skill needs. Taking the example of the automotive industry, we will provide an overview of findings and consequences for the establishment of new industries.

Figure 2. **The IDQ[®] process**



2. Project model

The project model is based on the hypothesis that a company is well aware of its skill requirements but lacks the tools that would allow a systematic and efficient acquisition and processing of this corporate knowledge to develop appropriate qualification measures swiftly. The KWB project used this hypothesis to develop the IDQ[®] system. This multistage data collection procedure actively involves the industry's experts in the network to determine skill-related trends. The phased IDQ[®] process designed by researchers in conjunction with KWB is depicted in Figure 2 ⁽²⁾.

The system was employed during the course of the projects to study some established trades (Figure 3).

Figure 3. Investigated sectors

KWB Project I (2000-2001)	KWB Project II (since May 2002)
• Construction (constructors and building trades) • Printing/media • Electrical trade • Motor vehicle sector • Retail • Insurance	• Confectionery • Bakery • Butchering (craft & industry) • Automatic vending • Chemistry (launch 5/2003) • Facility management

Selected findings from the motor vehicle sector follow.

3. Selected results from the motor vehicle sector

In the paper-and-pencil survey, the experts rated the topics generated in the first workshop on importance for qualification development. A five-point equidistant scale was used, with 'not at all important' as the lowest value (1) and 'extremely important' as the highest possible value (5) ⁽³⁾. Ten of the most salient items are presented as examples (first four columns in Figure 4).

⁽²⁾ Detailed descriptions of each step can be found in Diedrich-Fuhs et al. 2001, Bromberger and Diedrich-Fuhs 2003 and Esser and Bromberger 2002.

⁽³⁾ Equidistant scales assume that the intervals between ratings are identical. Despite the basically ordinal nature of the categories, mean values and standard deviations can be calculated (cf. Bortz and Döring 1995, p. 164).

Figure 4. **Top Ten motor vehicle sector**

No.	Qualification trend item Motor vehicle sector	Mean	Standard deviation	References to:				
				Initial training	Additional qualification	Regulated continuing training	Unregulated continuing training	Other (informal) continuing training
1	Passive vehicle safety	4.45	0.69	☒	☐	☒	☒	☐
2	Customer relations	4.45	0.83	☒	☐	☒	☒	☐
3	New diesel engine technology	4.40	0.68	☒	☐	☒	☒	☐
4	Permanent continuing training	4.30	0.86	☒	☐	☒	☒	☒
5	Increase in cut-throat competition	4.25	0.91	☐	☐	☒	☒	☐
6	Access to technical specifications	4.25	0.97	☒	☐	☒	☒	☒
7	Driver service expectations	4.25	0.79	☒	☐	☒	☒	☒
8	Aftersales market	4.20	0.83	☐	☐	☒	☒	☐
9	Effective labour allocation	4.20	1.06	☐	☐	☒	☒	☒
10	Direct petrol injection	4.20	0.95	☒	☐	☒	☒	☐

The second expert workshop assessed the findings of the written survey according to their relevance in adapting vocational training measures. Participants weighed education providers' potential responses to existing qualification needs (see the five right columns in Figure 4):

- statements classified as 'initial training' and 'regulated continuing training' (chamber regulations, further training regulations) refer to the necessity for appropriate federal regulations;
- in the view of experts, items assigned to 'additional qualification' or 'unregulated continuing training' do not require strict legal regulation and can thus be anchored in training measures organised by an employer training provider;
- the heading 'other (informal) continuing training' subsumes all 'soft forms' of continuing training that can be employed to react to skill deficits. They include, for instance, measures provided by manufacturing companies, technical books and journals, manuals and attendance at trade fair events.

It is clear that eight of the 10 most important topics are cross-technological ones. Three trends were chosen from the data for more detailed description:

- service orientation;
- information orientation;
- modern vehicle technology.

Figure 5 reveals that customer service is a fundamental feature of the motor vehicle sector. For instance, employee-customer relations, with a mean score of 4.45, are seen as a salient facet of future qualification development. Client relations following contract fulfilment (aftersales service, service hotlines) also earned above-average ratings from the experts. Insurance brokerage during car sale negotiations was also considered to be highly relevant.

Figure 5. **Service orientation**

Qualification trend item	Mean	Standard deviation	References to
Customer relations	4.45	0.83	Initial and continuing training
Aftersales market	4.20	0.83	Continuing training
Service hotlines	3.85	0.99	Initial and continuing training
Accident damage management	3.65	0.81	Continuing training
Sales and service	3.60	0.94	Continuing training
Insurance brokerage	3.55	1.15	Continuing training

Increasing computerisation is transforming daily operations in the motor trade. Today's garage workers need frequent ready access to technical data and must be qualified to retrieve and use the data in inspecting, maintaining and repairing vehicles. Telediagnosis and garage networking are becoming common services of the automotive trade and have a direct bearing on technological innovations at service centres and dealerships (Figure 6).

Figure 6. **Information orientation**

Qualification trend item	Mean	Standard deviation	References to
Access to technical specifications	4.25	0.97	Initial and continuing training
Online information on vehicle inspection, maintenance & repair	4.00	1.12	Initial and continuing training
Electronic damage communication	3.95	0.94	Initial and continuing training
Sales network development	3.80	1.06	Continuing training
Garage networking	3.50	0.89	Initial and continuing training

As well as the topics listed above, modern vehicle technology remains an important element of occupations in vehicle sales and service (Figure 7). The experts continue to see subjects like passive vehicle safety (airbags, etc.) as a training field. Moreover, automotive employees must become familiar with the latest technological advances.

Welding will remain a major part of car bodyshop jobs, but use of aluminium will create new requirements (lightweight bodies, new carriage manufacturing and repairing materials) and enable workers to perform higher-quality operations.

Figure 7. **Modern vehicle technology**

Qualification trend item	Mean	Standard deviation	References to
Passive vehicle safety	4.45	0.69	Initial and continuing training
New diesel engine technology	4.40	0.68	Initial and continuing training
Onboard diagnosis	4.15	0.59	Initial and continuing training
Lightweight bodies	3.90	1.17	Initial and continuing training
New body-work materials, new repair technologies	3.85	0.99	Initial and continuing training
Axle measuring systems	3.65	1.09	Initial and continuing training
Bonding technologies	3.55	0.76	Initial and continuing training

4. Conclusion: industries are evolving

We conclude, in summary, that measuring, tuning, analysing, investigating, diagnosing and communicating are coming to the fore as capabilities expected of workers.

These findings demonstrate that technological innovations in the automotive industry do not automatically lead to the establishment of new industries. Instead, the data suggest that the importance of worker knowledge is evolving. Job profiles of automotive workers are being enriched by tasks requiring additional knowledge and, therefore, additional training.

The results of the KWB project can help us identify special skills that will be needed in the industry in time to provide demand-oriented training programmes.

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Early identification of skill needs in selected sectors

Summary and conclusions

Ralf Mytzek

Social Science Research Center Berlin (WZB), Germany

Sectoral research on skill needs is particularly promising, because it enables the researcher to obtain a deeper insight into the extent, the causes and the effects of changes in the demand for certain skills than it is possible with research focused on the whole economy. The main users of skill needs analyses, and the most important societal actors, are often organised along sectors and industries. In addition, in recent years we observe further development of sectoral training systems across Europe, thus complementing established vocational training systems (Warmerdam, 1997). Companies belonging to a certain sector show a relatively homogenous distribution of occupations, which should make it easier to find common trends that cover a broad range of occupations in the observed sector (Hilbert, Mytzek 2002; Neugart, Schömann 2002).

The workshop discussion dealt with the identification of skill needs in selected economic sectors in Europe ⁽¹⁾. The sectors (tourism, hotels, recycling and motor vehicle) have characteristics such as size, economic relevance, innovations, positive employment dynamics and/or innovative production models that qualify them for in-depth skill needs studies. Depending on the different aims of the projects, primary and secondary quantitative analyses, case studies with work process observations and interviews, and various holistic or combined methods were employed. The contributions and discussion at the workshop were structured by two questions: what kind of impact do the observed trends have on the skill needs of 'middle-skilled' employees?; and are the identified new qualifications complementing already existing job requirements or do they replace other qualifications?

In addition, questions about comparability and transferability of the results

⁽¹⁾ See contributions in this volume by Abicht and Freikamp, Hermann, Kaminioti, Bromberger and Esser, presented at the workshop.

of a certain sector in one country were raised. At least in the tourism sector the discussion disclosed common patterns of skill needs in several countries. Here, an underlying common structural change towards more specialised products, e.g. tourism for disabled people or wellness tourism, leads to the emergence of various new qualifications. Because of differences between the travel markets in different countries and different development stages of the tourism sector, the level and composition of skill needs (languages, country and customer specialisation) might differ. The comparison of skill needs in countries with different development stages is an example how international comparison can be used as a tool to analyse current and future skill needs. While the impacts of the changes in skill needs for vocational education and training are already evident, it is unclear whether these new skills lead to new occupations or rather enrich the established vocational profiles. This question depends on the different systems of vocational education and training in each country.

One crucial element of the case study design turned out to be the identification of trendsetters or key providers. Case studies are supposed to represent groups of similar enterprises or organisations and the aim is to achieve insights and results that are transferable to other organisations. Best practice would be to create a control group of enterprises and observe whether the development of skill needs is at a higher level among trend-setting enterprises, with skill needs in other enterprises following on.

The example of the highly standardised work processes of a major hotel chain in Germany shows that standardisation in the service sector does not necessarily lead to decreased complexity of occupations. For instance, implementing a reservation system and a new sales policy throughout the chain demands a major boost in skill needs at reception, where every front desk worker is now selling complex travel products. The skill needs of the hotel chain are driven by technological change and changes in work process while the expected impact is complex: different implementation phases of new technology and work processes involve changes in skill needs for different occupational groups.

Another important but controversial topic was the pace of the observed changes in skill needs and the underlying structural changes. Based on empirical evidence from Great Britain and other European countries (Pearson et al., 2001) and from Germany (Bromberger, Diedrich-Fuhs, 2003) it was argued that most changes in the 'new economy' turned out to be myths; changes in skill needs take place not in a revolutionary but rather in an evolutionary way. Focussing on especially dynamic sectors and industries, other workshop participants tended to disagree with this perception.

The overall picture given in the workshop was that quantitative forecasting of detailed professional skills is a difficult task because technical and organisational change is dynamic and all prognoses are dependent on economic cycles. Yet the demand for broader skills and general competences seems to be more constant over time. Nearly all contributions stressed the importance of personal and general or core skills in supporting technological and organisational innovations in the various sectors. Language skills, communication and the ability to learn often appeared to be just as important as technical and professional skills. A good way to acquire these skills seemed to be the work process itself, e.g. through vocational training courses, such as apprenticeship systems, that link learning and working.

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PART V

Identification of transversal competences and qualifications

This part is based on presentations and discussion at the workshop, moderated by Werner Peter Herrmann, European Commission/Cedefop. This workshop discussed cross-occupational and cross-sectoral skill needs. The first part of the workshop addressed new skill needs required for handling information and communication technologies, and computerised systems. While, in the past, demand for highly qualified people was industry and job-specific, the universal usage of ICT nowadays introduces the requirement for higher skill levels as a common reality. The second part of the workshop focused on changing skill requirements, decrease in the number of low-skilled jobs, and resulting challenges for low-skilled individuals to keep their employability despite low education levels. A summary and conclusions of results of the workshop discussion is provided in the contribution of the workshop rapporteur Tiina Annus, PRAXIS, Center for Policy Studies, at the end of Part V.

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Identification of transversal competences and qualifications. Summary and conclusions

Identifying and measuring ICT occupational and skill needs in Europe

Veli-Pekka Niitamo

*Global Strategic Resourcing, Nokia, Finland,
and Supply-Demand Task-Force, Career Space*

Information and communication technologies (ICTs) introduce major changes to industrial processes and business functions. ICT effects on productivity and competitiveness at the company, as well as for the economy, speak for themselves. However, it is important to recognise that ICT is not only an opportunity but also a challenge: only adequately skilled people can foster ICT advancement in Europe. Adequate response to skill needs is important not only for the ICT sector as such but also for other industries that utilise ICTs and eventually for the whole population i.e. current and potential ICT users. ICT competence needs, for both experts and users, are changing rapidly and represent a moving target for policy-makers and practitioners. Skill shortages, gaps and mismatches slow down productivity and have unfavourable effects on European competitiveness. The article proposes a common terminology and a set of actions to respond to future demand for ICT.

1. Introduction

Information and communication technologies (ICTs) change the way of communication, data transfer and management processes in industries and businesses. This change is caused by adding automation and intelligence to every product and to the way products are transported and recycled. Just as during the Industrial Revolution, it is preceded by a first wave of early adopters and companies, which do not yet succeed in breaking through the barriers of markets and the society.

Effective use of ICT can enhance an organisation's productivity and competitiveness, but this calls for corresponding changes in human resource management, the support of government policy and a conducive company

culture. Such aspects must be managed effectively. Tradition-bound organisations and those slow to change are unlikely to be able to derive potential benefits from ICT. Attempts at introducing ICT in adverse contexts can often fail and might even end up being wasted investment.

Scientific studies show that the productivity effects of ICT at both macro and micro levels in Europe have, so far, been smaller than those found in the US, where extraordinary labour productivity growth was recorded in sectors that benefited from ICT usage. Enterprise-level studies show that ICT can help improve productivity and business performance. ICT is closely linked to innovation. A clear and intensifying concentration tendency of ICT-related production, and research and development (R&D) has been detected.

The competitiveness of European industry is highly dependent on both the effective use of ICT for industrial and business processes and the capabilities of existing and new employees. The battle for global market share will be fought and won by the enterprises that are fast adopters and learners. The slow transformation of society and its institutions is presently a barrier to movement into the new information era.

The skill and competence needs of the new environment may have been misinterpreted. The need for new generic competences and even technical skills might be disregarded, as they would precede more fundamental changes than the educational institutions are ready to accept.

2. The problem and its scope

The European Council 2000 in Lisbon resolved to launch a drive to make the EU 'the most competitive and dynamic knowledge-based economy in the world'. Given the major shift to the new information era, the efforts by the European Union and the Member States have not been far-reaching enough. In the longer term the need for information-handling capacity and 'intelligence' will grow in all products and in everyday services. The need for ICT skills within the ICT sector and among users is increasing and according to the latest reviews, employers' expectations of the skill level continue to rise.

Cost-effective development of e-government and e-services would require the whole population within Member States to have the skills required and access to such services. The costs of maintaining parallel systems for a long period would adversely affect EU competitiveness as compared with the new growing economies and the US.

Internet penetration in EU households has risen from 18.3 % in 2000 to 40.4 % in 2002. However, only 21 % of citizens aged over 55 personally use

the Internet. Even though the growth rate is high, there are significant barriers to reaching the remainder of this segment.

The highly cyclical nature of the ICT sector and its current economic stagnation has understandably produced a major loss of confidence in high-tech development. The layoffs of ICT specialists have caused a 'signalling' from the labour market to young people considering their future careers, and in some Member States this has resulted in a fall in applications for ICT courses at universities and, in others, in cuts in funding for these institutions.

The joint long-term vision for ICT and its potential for European development should be strengthened. To be able to take further steps towards the information society, all aspects of development – technology, the markets and society – should act together as enablers of the process. ICT and e-skills remain the basis for all of these.

Public/private partnerships are very important in responding to the challenges of the skill/competence needs in the ICT sector. Currently, at the European level there are only very few, and Career Space is one of examples where an industry-led consortium of major European ICT companies created a partnership with educational institutions and professional organisations. Career Space focused on graduate specialist levels, initially identifying skills/competences, jobs and occupational areas in most critical ICT fields. At a later stage it provided insight to methodologies in supply/demand forecasting and also worked out curriculum guidelines for universities and technological training institutes, taking into account the needs of the sector and the ways in which ICT skills mismatch can be reduced ⁽¹⁾.

3. ICTs and employment

Employment in ICT companies is not rising at the moment due to the world economic situation, which also affects the user sector. The ICT sector is suffering badly because its customers are both individual users and the industrial and service sectors. Yet, for exactly the same reason, its growth potential is very high.

Member State statistics provide evidence staff no longer required by ICT companies have been able to find employment in other sectors (ICT users) and in SMEs.

In Finland the entry of new graduates into the labour market has been greater than the growth in unemployment. Unemployment among Bachelors

⁽¹⁾ The results can be consulted at www.career-space.com

and Masters of Engineering in electronics, automation, telecommunications and information processing fields has risen from 647 to 1 242 in the two years from May 2001 to May 2003. At the same time the number of graduates from the respective fields has risen by almost 40 %, reaching 3 300 graduates in 2002.

The use of ICT within industry and the services has risen fast. In 2001, 81 % of larger companies and 67 of SMEs were using the Internet. The respective figures were 97 % and 79 % in 2002. The use of the Internet for e-commerce purposes is less developed and has even been declining.

4. Proposal for common terminology

E-business and other advanced processes of the information society cannot proceed beyond the capability of the users. The need for competence is also obvious at the expert level of ICT development and in its user applications in other sectors.

Figure 1. **Matrix of strategic ICT competence**

	Strategic level/ innovation	System level/ integration	Operations level
ICT specialists	Competent practitioners		
ICT sector specific users		Application and process focused users	
ICT generic users		Generic users	

Competent practitioners require deep knowledge, understanding and experience of some aspects of ICT and its application.

Sector application users are competent users of ICT tools developed for a specific sector and they also have a good understanding of the sector.

Generic users are competent users of generic tools (e.g. Word, Excel, Outlook, and PowerPoint).

ICT competence needs both at the expert and user level are changing rapidly. Even though some Member States have succeeded in meeting most of the quantitative needs, the qualitative gaps may be expanding. The deficiencies have been defined as:

- skills shortage as a quantitative lack of adequately skilled people in the labour market;
- skills gap as a competence shortfall between the current and needed competence levels of staff within companies or other organisations;

- (c) skills mismatch as a mismatch between the competence of the trainee or graduating student and the competence expected by the employer.

The relentless evolutionary change of ICT continues to provide a 'moving target' for policy-makers and education and training providers. According to a scenario-based long-term vision, the lack of both quantitative and qualitative competence will keep on growing if remedial measures are not undertaken.

Skill shortages, gaps and mismatches slow down productivity development within ICT, the user sector and small and medium-sized companies. The combined effect on European competitiveness therefore becomes significant. In addition, the development of a new e-market depends on the penetration of e-literacy and user skills among citizens.

The results of the BIAT study on ICT skills and curricula commissioned by Cedefop (Petersen and Wehmeyer, eds, 2003) permitted a number of quantitative and qualitative statements on the supply and demand issue. Furthermore, the analysis led to elaboration of 14 generic work area orientated ICT skills profiles along with commonly used job titles, job descriptions, tasks, related technology areas, and aggregated skill profiles. Each of the skill profiles detailed skills needed at a specific sub-degree level and indicated existing skill mismatch taking into account current ICT training profiles.

5. Barriers to mobility

The internal market and approval of vocational and professional level certificates provide a basis for mobility yet several Member States report regional skill shortages. There are obviously still reasons why people do not move in their search for ICT jobs. Company certificates make it easier to move across borders and stay in employment in the ICT sector. However, other means of certification and accreditation and assessment of skills ought to be explored which are not company-specific. The ECDL (European Computer Driving Licence) and EUCIP (European Certification of Informatics Professionals) as well as CompTIA (Computing Technology Industry Association) activities are good examples and they should be further propagated.

Mobility depends significantly on the transparency and recognition of qualifications. Hence, processes that increase the openness and clarity of education systems in line with the Bologna and Copenhagen processes should be encouraged.

Social issues such as pension portability, mutual recognition of education,

job opportunities for spouses and differences in taxation are very important. Barriers to mobility are often more related to family mobility than to individual professional mobility. Some of the problems can, of course, be met by company actions. The role of the Commission is to ensure European solutions for social welfare and related policies.

The acceding countries have a different set of problems. There is a huge generation gap between elderly and younger people and their ICT skills. Their capacity to attract new industries is high, but ICT professionals might look for a higher salary level in other European countries.

6. Future demand for ICT skills and actions needed

ICT has an impact on productivity in all sectors if accompanied by organisational and skills development. It also creates the basis for future innovation and a knowledge economy. Because the impact of the economic climate on ICT-related industries and services is high, the ICT Skills Monitoring Group recommends the following.

The ICT specialist labour market should be monitored and a multiple, scenario-based approach should be adopted to estimate expected future demand; this should extend to all Member States and accession countries. The scenarios should be regularly updated and made increasingly robust by learning from the differences between previous projections and subsequent actual employment levels. The EU level estimates must be based on national figures that are reconciled with the realities of official Member State Labour Force Surveys and the latest national industry analyses.

Expected demand levels based on the scenarios should be made available to universities and educational institutions, helping them to follow the long-term vision of European development, not short-term economic trends. All stakeholders, including the Commission, Member States and industrial partners, should support the chosen policy measures.

The Member States should continue to track their ICT employment and skill changes carefully. Indicators such as unemployment figures are readily available. Follow-up of the number of ICT professionals and their career path changes within ICT and user industries is recommended. Monthly job vacancies in ICT could be used as a barometer.

Efforts to increase the penetration of the Internet as well as ICT equipment and services among companies and their employees should be encouraged.

Employers should be encouraged to recognise that investment in ICT needs to be accompanied and evaluated by means of other HRD measures.

These include provision through educational systems and curricula. Needs for new generic skills should be taken into account.

The competence requirements for e-skills represent a 'moving target' because technology and competence requirements are accelerating. This calls for a new type of institution and flexibility. Public-private partnerships can play a role, as well as cross-level educational cooperation. Special attention should be given to developing training provisions at non-university and vocational or sub-degree levels of training.

Programmes and actions for European cooperation should be strengthened and made more sustainable between providers of training, both public and private. Cooperation is needed to define standards for mutual recognition of training modules and credit transfer, elaboration of vendor- or platform-independent certification and skills assessment. New ways for certification and accreditation and assessment of skills ought to be explored.

The generation gap in e-skills needs to be narrowed to enable the development of e-Government and related services. The time horizon for such development, especially in accession countries, should be acknowledged.

Because research and development (R&D) spawns innovations and creates employment, yielding a technology-led competitive edge over other regions, there must be a special focus on the high end of the skill gap in ICT. There is high threat of losing R&D work (e.g. product creation) to the new growing economies of the East due to the availability of competences and talents and the high level of government subsidies for R&D investment. Labour mobility towards Europe should be increased to balance the growing mismatch of the outflow of new job opportunities from Europe to Asia.

European demographic development indicates that the proportion of the working population will diminish if preventive actions are not taken. Extending active working years and increasing the flexibility of the employment market should be encouraged.

7. References

- Manninen, A. *Supply and demand aspects of e-skills: draft policy paper*. Brussels: EICTA, 2003.
- Petersen, A.W.; Wehmeyer, C. *ICT practitioner skills and training solutions at sub-degree vocational level in Europe: framework and guidelines for new ICT training profiles and curriculum development: final report*. Flensburg: BIAT, 2003.

Skill and qualification needs at a time of structural change: the example of the IT sector in Germany

Peter Bott

Federal Institute for Vocational Training (BIBB), Germany

Research being conducted by the Federal Institute for Vocational Training (BIBB) as part of the initiative for Early Identification of Qualification Needs of the German Federal Ministry of Education and Research (BMBF) includes analysis of job advertisements. The results presented here are based on a representative sample of advertisements for jobs in IT and a subsequent survey of the advertisers.

Qualification and skill requirements for new recruits to this highly innovative activity are very demanding. Employers are mainly looking for highly specialised personnel. Although the posts on offer usually stipulate graduates of universities or specialised colleges of higher education, employers in fact put more weight on specialised knowledge and experience than on paper qualifications. Besides specialised knowledge, soft skills, such as the ability to work in a team and to communicate well, are indispensable for successful applicants. The rapid pace of innovation in the IT sector means that new employees must be willing to undergo regular further training. The difficulty employers encounter in finding personnel with the appropriate skills is reflected in the fact that about a fifth of job vacancies remain unfilled six months after being advertised. Employers describe the lack of combined specialist and soft skills as candidates' principal shortcoming.

1. Introduction

In the words of Reinberg and Hummel (2003), 'The demand for highly skilled personnel is set to increase in both relative and absolute terms. (...) With unemployment running at 4.5 million, Germany sees itself confronted with a flagging economy, a procyclical reluctance on the part of industry to invest,

and empty government coffers. The need for political action is greater than it has been for a long time.' While research under the BMBF-sponsored Network for early identification of skill and qualification needs (FreQueNz) project is concerned with current skill requirements rather than with medium- or longer-term projections, Reinberg and Hummel (2003) seek to predict trends for the medium term. Thanks to these different approaches and methods for determining skill trends, the results provide valuable information concerning challenges for future vocational training policy and the need for action, both to those starting out in the IT industry and to those who wish to maintain their employability.

In 2000 the acute shortage of IT specialists prompted the German government to introduce its 'green card' scheme with a view to attracting the necessary personnel from abroad. It was hoped that the scheme would make it possible to recruit up to 20 000 people by 31 July 2003, on contracts for not more than five years, with a minimum of bureaucracy. However, developments in the German economy meant that the surge in new job vacancies in the sector expected at the end of the 1990s failed to materialise. Even so, Germany continues to need people with proven IT skills.

Employers, apparently, are still dissatisfied with the number of suitable candidates applying for vacant jobs in ICT despite the introduction of the green card scheme. The German Information, Telecommunications and New Media Association (BITKOM) has produced a position paper calling, in the interests of the IT industry's flexibility and competitiveness, for the green card system to be extended from 23 June 2003 until a new law on immigration is introduced.

In order to discover what skills IT firms expect from new recruits at a time of structural change, in 2002 the Federal Institute for Vocational Training (BIBB) in Bonn conducted an analysis of a representative sample of job advertisements and an advertiser survey. The objective of this two-stage process was to compare the skills and qualifications employers were looking for (i.e. their wishes) with what proved to be available in the market (i.e. reality).

The analysis covered 5 000 advertisements in the regional and supraregional press and online media. After six months a letter was sent to the advertising firms asking them to complete a questionnaire. Questions concerned the job described, the qualifications and skills required and whether or not the post had been filled, together with details of the person recruited. The questionnaire was to be answered for each separate job vacancy. Firms that had advertised more than three vacancies were no longer approached because of the burden of completing the questionnaire

more than three times. Their exclusion, as well as that of firms to which for various reasons the questionnaire could not be sent by post, reduced the sample from its original size of 5 000 advertisements covered by the survey to 4 409. Responses were received for 977 job advertisements, representing a response rate of 22.2 %.

The 5 000 advertisements analysed related to core IT occupations such as applications programmer (22.4 %), computer centre/network specialist (14.6 %) and marketing personnel (13.1 %), as well as a number of hybrid occupations (36.3 %). The remaining 13.3 % did not fit clearly into the occupational classification of the *Bundesanstalt für Arbeit* (BA), the Federal Employment Services. The advertiser survey yielded a similar breakdown of jobs; in this respect, the sample can be regarded as representative.

2. Job advertisements

60 % of all jobs were advertised for newly created posts; 75 % in case of marketing personnel, 65.5 % in case of programmers and 55.8 % computer centre/network specialists. The tasks involved were mainly those customary in the branch. New qualifications and skills were asked for, chiefly in the case of programmers (14.3 %) and marketing personnel (13.4 %). According to the advertisers questioned, the availability of skills was poor. A total of 78.4 % of advertisements for marketing personnel and 76.7 % of those for programmers had failed to generate applications from suitably qualified people. Some 52.2 % of jobs were publicised internally before being advertised externally in the regional or transregional press, leading to the assumption that suitable staff are difficult to find internally. Over 80 % of firms considered continuing and further training to be the most suitable means of meeting future skill requirements for all types of jobs in the sector. In-house training for this purpose was thought important and worthwhile only for 38.6 % of the jobs advertised. When asked why no internal candidates were considered suitable after in-house training the reply was that in 78.6 % of cases no suitable training existed. Respondents also claimed that in-house training could not be used to deliver the specialist knowledge and skills concerned. A similar opinion was expressed regarding the frequently requested key or soft skills. In 62.8 % of cases, key skills could not be delivered by in-company training.

3. Skill requirements

Jobs advertised by IT firms are generally for specialist personnel. This is particularly true in the case of programmers (about 75 %). However, qualification requirements for vacant jobs are by no means uniform. Thus, while a university or other specialist higher education qualification is necessary in around 40 % of cases, well over 40 % do not expressly mention any formal qualification. The table below gives the percentage breakdowns of qualifications stipulated in job advertisements for the various occupational fields.

Table 1. **Formal qualifications stipulated in advertisements**
(figures in %)

Type of qualification	Applications programmer	Computer centre/ Network specialist	Marketing personnel
Vocational qualification	10.0	16.7	14.8
Specialist technical college	2.7	2.5	1.9
Specialised college of higher education	42.0	42.6	38.0
University	40.2	33.3	39.8
Certified continuing training	0.5	1.2	1.9
No formal qualification	51.1	43.2	52.8
Comparable skills	17.8	32.1	21.3

NB: Multiple answers allowed

In the survey, firms were asked whether only candidates with an academic qualification would be considered for the post offered. The answer was affirmative in 36.3 % of cases for applications programmers, 16.1 % for computer centre/network specialists and 25.7 % for marketing personnel. This means that, for most jobs in IT, the opportunities for people without a higher educational qualification are good. But, in fact, about half the vacancies are filled by candidates with a qualification from either a university or a technical college of higher education.

On the question of the type of training which usually served as preparation for the jobs, the recruiting firms answered as follows (Table 2):

Table 2. What training usually serves as preparation for the job advertised? (figures in %)

Type of training	Applications programmer	Computer centre/ Network specialist	Marketing personnel
Technical school of higher education or university	84.4	58.8	61.9
Advanced vocational studies	44.6	42.4	33.6
Certified further training	39.7	50.3	39.8
Teacher training	25.9	39.4	38.1
Certified continuing training	25.9	46.1	32.7
Other qualification	4.9	7.3	8.0
None	3.1	3.6	5.3

NB: Multiple answers allowed

Source: Survey among advertising firms

On average 62 % of IT job vacancies are filled by candidates with qualifications obtained at university or at a technical college of higher education; the predominance is particularly marked in the case of computer programmers.

While less than 2 % of job advertisements specify certified continuing training, the survey findings show that in fact its role is far from negligible and that 10 % of successful candidates possessed a certificate of specialised continuing training (Table 3). Continuing training is steadily gaining in importance in IT, also the case for key or soft skills.

Results generally show that a formal qualification is often not a necessary requirement for a candidate to be successful but that the specialist skills possessed are decisive. Employers stated that a formal qualification was not absolutely necessary for 62.8 % of applications programmer posts advertised, for 56.9 % of those for a computer centre/network specialist and 68.2 % of those for marketing personnel. What was required was the relevant, and often very specific, specialist knowledge.

Specific specialised knowledge and skills are stipulated in over 80 % of job advertisements. To discover which particular skills were considered important the questionnaire asked advertisers to rate specialist skills on a seven-point

scale ranging from 'Not at all important' to 'Very important'. In the case of programmers the most important skills were given as follows: IT solution design and implementation (77.5 %), C++ (58.4 %) and Java (50.7 %). Most important in the case of the computer centre/network specialists were network, systems and web server administration (81.4 %), user support (73 %) and solution design and implementation (69.6 %). Skills rated most important for marketing personnel were IT consultancy (70.9 %), solution design and implementation (69 %) and management, coordination and organisation (65.5 %). Firms were asked to state how far successful applicants' skills matched requirements. The replies showed the figure to be around 75 % for programmers, over 80 % for computer centre/network specialists and just on 80 % for marketing personnel.

Table 3. Formal qualifications of successful candidates (figures in %)

Type of training	Applications programmer	Computer centre/ Network specialist	Marketing personnel
Vocational qualification	8.7	16.2	15.7
Technical college of higher education or university	67.1	39.4	61.8
Advanced vocational studies	6.4	5.6	2.2
Recognised further training qualification	8.7	18.3	12.4
Certified continuing training	5.8	15.5	7.9
Other qualification	3.5	4.9	—

Source: Survey among advertising firms

In addition to specialist qualifications and skills, key skills continue to be very important for successful IT applicants (Table 4). Press advertisements for programmers, for example, stipulated an entrepreneurial attitude (99.1 %), the ability to contribute to work in a team (93.8 %) and a definite customer-service orientation (90.2 %). The situation in the case of computer centre/network specialists and marketing personnel was very similar. Marked differences emerged when firms were asked in the subsequent questionnaire to rank key or soft skills on a seven-point scale of importance for the job concerned. Entrepreneurial attitude was less important for programmers and computer centre and marketing personnel, being considered important in only 50 % of cases. Other soft skills gained in weight compared with what was stated in the advertisements.

Table 4. **Soft skills required (figures in %)**

Skills required	Applications programmer	Computer centre/ Network specialist	Marketing personnel
Cooperative team working	93.5	97.2	97.7
Ability to learn and work independently	89.7	90.0	80.7
Communication skills	89.3	95.8	98.9
Cognitive/problem-solving abilities	86.1	89.1	89.5
Readiness to undergo continuing training	89.2	90.8	93.3
Customer/service-orientation	51.8	51.1	94.3

Source: Survey among advertising firms

The work of programmers, computer centre/network specialists and marketing personnel calls for constant contact and discussion with customers to devise and implement solutions appropriate to their particular needs. It is understandable that customer-service orientation is one of the soft skills most frequently requested. The qualifications specified in a job advertisement are designed to filter out unsuitable candidates and simplify the process of short-listing. Only when the basic requirements appear to be met and candidates look suitable for the advertised post do the decisive skill requirements come into play. Thus, after the preliminary selection has revealed suitable candidates, the emphasis at the job interview stage shifts to soft skills. Ability to communicate, for instance, does not show in a written job application, but can be ascertained at the interview stage. It is worth emphasising that firms attach much importance to candidate's willingness to undergo continuing training. This is the case for around 90 % of the jobs to be filled, not surprising, considering the very rapid pace of innovation in the IT field.

4. Posts filled and successful candidates

Firms advertising IT jobs received an average of 35 applications. Of these about 30 were from people without the desired qualifications and skills, since an average of only six were shortlisted after the written applications had been examined and five asked to attend the interview. The percentage of posts not filled following the advertisement's first publication was over 30 %, making

repeat publication necessary. The greatest difficulty firms encountered was in finding applicants for marketing posts with the necessary skills; here 37 % of jobs had to be readvertised. The situation was very similar in the case of programmers, where 34 % of jobs had to be readvertised.

The following table illustrates how difficult it is for firms to find the skills they need (Table 5).

Table 5. Posts still unfilled six months after advertising (figures in %)

Total	Applications programmer	Computer centre/ Network specialist	Marketing personnel
19.3	22.5	10.5	22.1

Source: Survey among advertising firms

Some 20 % of posts were still not filled six months after publication of the advertisement due to lack of appropriately qualified candidates. Again, the demand is for highly specialised personnel who could not be found among the firm's existing staff. Over 90 % of posts filled involve external candidates. Moreover, in order to meet the firm's particular requirements, over half the successful candidates are given further training. Generally firms provide special further training for 67.4 % of those selected for marketing and 54.9 % of newly employed programmers. This training helps recruits settle more easily into their new jobs. In most cases recruits are assumed to be willing to undergo additional training.

Firms taking on new IT staff are anxious to fill their vacant posts as quickly as possible. Where suitable candidates present themselves, the average time elapsing between first publication of the advertisement and recruitment is only 11 weeks, indicating the urgent need to fill the post and carry out the tasks involved.

A look at personnel structure in IT shows that men predominate. More than 80 % of all posts advertised in the IT sector lead to the appointment of a male candidate, with the figure as high as 93.7 % in the case of computer centre/network specialists. For marketing work, women account for 28.2 % of jobs. These figures, however, do not provide information on women's chances of obtaining an IT job since the survey did not ask specific questions about the proportion of females applying. Advertisements hardly ever stipulate the sex of the candidates required and tend to use non-gender-specific job titles. Specifically female job titles are used in less than 1 % of cases.

5. Summary and conclusion

Up until the late 1990s, candidates from other areas of activity applying for IT jobs in Germany still had a good chance of success, but now the tendency is to look for people whose specialist qualifications fit the vacant post exactly. Formal qualifications required by advertisements are very demanding with around 40 % specifying graduates of a university or technical college. This requirement is apparently only designed to serve as a filter in preliminary selection: when firms were asked how important formal qualifications were, around 60 % replied that a candidate's specialised knowledge and skills were the decisive factor for success.

Anyone wanting a job in IT must possess the appropriate soft skills. More than 90 % of job advertisements studied requested the ability to cooperate, to work in a team, to communicate, and similar skills. Candidates must also be willing to undergo further training, which is hardly surprising given the rapid pace of innovation in the IT sector. Furthermore it is striking that internal IT recruitment is low. More than 90 % of job vacancies were filled by external applicants.

IT firms expressed dissatisfaction with the current supply of specialist personnel in the labour market: about 20 % of jobs advertised were still unfilled six months after advertising. The dynamic pace of innovation in the sector demands a high degree of specialisation, proven professional and project experience, a willingness to undergo regular further training and considerable soft or key skills. Firms particularly deplore the shortage of candidates able to offer a combination of both specialist and soft skills.

At a time of structural change and economic weakness, which inevitably affect the labour market, both longer-term forecasts and current job market analyses confirm that there is still a considerable need for well-trained specialist personnel. The German government has duly taken action to assist the IT sector. Shortly before it was due to expire, on 31 July 2003, the government renewed the green card scheme until the end of 2004.

6. References

Reinberg, A.; Hummel, M. *Bildungspolitik: steuert Deutschland langfristig auf einen Fachkräftemangel hin?* Nuremberg: IAB, 2003. (IAB Kurzbericht, 09/2003). Available from Internet: <http://doku.iab.de/kurzber/2003/kb0903.pdf> [cited 4.2.2004].

New challenges for the ‘at risk’ group in the labour market

Hilary Steedman

*Centre for Economic Performance,
London School of Economics, United Kingdom*

The ‘at risk’ group ⁽¹⁾ in European labour markets is defined as those with no further education or training after compulsory schooling. Proportions of ‘at risk’ in the labour force differ between European countries but at least 20 % will fall into this category in the coming decade. Demand for the ‘at risk’ group has fallen faster than numbers in the group. Where numbers have declined this has been largely the result of younger, better-qualified individuals entering the labour force. Schools in Europe need to do more to ensure that all those leaving education and training have the minimum level of education and skill necessary for labour market entry and continuing education. A ‘minimum learning platform’ is proposed and defined. Ways must also be found of encouraging employers to provide training to the ‘at risk’ group and to encourage the ‘at risk’ group to invest time and resources in their own training when in employment.

1. Introduction

From about 1990 onwards, an unprecedented change has been affecting the ‘at risk’ group ⁽²⁾ in all advanced industrialised countries. In a majority of EU countries and in Canada and the US, the gap between the earnings of the ‘at risk’ group and the higher-skilled has been widening compared to the 1970s. This was the result of large real wage gains at the top of the earnings scale

⁽¹⁾ The term ‘low-skilled’ caused us a lot of heart-searching when carrying out the Newskills work. It was perceived as pejorative, probably inaccurate (not all the so-called ‘low-skilled’ have low skills) and creating negative, self-reinforcing perceptions of deficit. In the Newskills report we used the technical term ISCED 0-2 group. A similar objection was made at the Cedefop conference and to try to overcome this and without sounding too technical, the term ‘at risk’ group is used to designate the group we are concerned with, namely those whose education has ended with compulsory schooling. ‘At risk’ is to be understood as being ‘at risk’ of unemployment and social exclusion as a result of having only basic, i.e. below upper secondary education.

⁽²⁾ See the previous footnote.

and stagnant real wages at the lower end. In the United States, where the labour market is more deregulated than in Europe and welfare less generous, the 'at risk' group experienced a fall in real wages.

In all of the EU countries included in the Newskills analysis except Germany, earnings differentials widened over the period 1980-95 ⁽³⁾. In France, the Netherlands and Sweden the change was only slight, but in Portugal and the UK the change was relatively large. In all industrialised countries from the late 1970s onwards, the 'at risk' group were increasingly likely to experience spells of unemployment, particularly long-term unemployment. In the flexible US economy this falling demand was reflected in falling real wages. In the more regulated European economies the wages of the 'at risk' group were kept artificially high at a price which meant that demand for the group fell and unemployment increased.

In the six countries studied, the 'at risk' group (defined as ISCED 0-2, that is those who had left education at the end of compulsory schooling) declined quite rapidly during the 1990s. But this decline occurred almost entirely as a result of entrance onto the labour market of higher-qualified young people and not as a result of the adult workforce upgrading qualifications. Since stocks differed considerably between countries at our benchmark date of 1985, differing rates of change have brought about only limited convergence among European countries in proportions with low skills. Even at present growth rates, in most European countries at least 20 % of the population will continue to fall into this category well into the coming decade. We can assume that the employment prospects of the 'at risk' group and associated social inequality will continue to pose a problem for Europe for many years to come.

2. The effect of technological change

Technological change can explain much of the fall in demand for the 'at risk' group. Most of the manufacturing sectors in which 'at risk' individuals are over-represented are 'low-tech' and most are continuing to contract. This only lends support to the thesis of a skill-biased technological change where increasing technological complexity is acting as a barrier to increasing employment of the 'at risk' group in manufacturing.

⁽³⁾ The Newskills project (Contract ERB-SOE2-CT-95-2006) was carried out in the framework of the TSER programme of the European Commission. Six countries (France, Germany, the Netherlands, Portugal, Sweden and the UK) participated in the project. The Final Report (2000) is available at <http://cep.lse.ac.uk/homepage/tser/> The main findings were updated and published in a special edition of the *European Journal of Education* Vol. 37, No 3, Sept. 2002, edited by Roberto Carneiro and Hilary Steedman.

In the service sector, employment prospects for the 'at risk' group are less bleak than in manufacturing. Certain service sectors where the group is over-represented are growing in most or all of the five EU countries studied (notably hotels and catering and retailing) ⁽⁴⁾. Anecdotal evidence from our case study firms also indicated that in some service sectors the demand for 'at risk' individuals would continue.

However, in the high-tech expanding sectors of the economy – with the exception of Portugal – the 'at risk' group were failing to maintain their share of employment. These negative employment trends were found at a time when the number of 'at risk' individuals in the labour force of these five EU countries were declining rapidly as older 'at risk' workers retired and younger workers with higher skills took their places. This indicates that the 'natural' rate of decline of the 'at risk' group in Europe is not sufficient to offset the decline in labour market demand for 'at risk' individuals.

But the Newskills project found that the skilled (intermediate) group is also starting to be affected by unemployment as technological change continues. We concluded that skill demand resulting from technological change will probably continue to grow and that both the 'at risk' group and those with intermediate skills will increasingly experience the need to participate in skill upgrading during working life.

As a consequence we may find that, in contrast to the past and present situation, it will be necessary for larger proportions of education and training qualifications to be acquired in adult life and that education levels are not fixed only during the period of initial education.

However, our research also showed that standards of basic education (e.g. mathematics) of many of those who leave school at the earliest opportunity are totally inadequate as a basis for upgrading. We concluded that it is essential to raise the standards of those who do least well in compulsory education. Only then will the whole population have the potential to build on their education.

A major policy failure that needs to be addressed is that schools in all European countries are continuing to produce too many young people inadequately equipped or prepared to take advantage of further education and training, a statement confirmed by the OECD's PISA study. What is worse, some of those who leave initial education have developed an aversion to learning as a result of their school experiences and the disastrous results of this are seen in the reluctance to 'go back to school' to acquire further education and training in later life.

⁽⁴⁾ France, the Netherlands, Portugal, Sweden and the UK.

3. A minimum education 'platform'

The period of basic (usually compulsory) education should not be primarily concerned with selection for higher levels of education. Schools need increasingly to focus on ensuring a minimum level for all (minimum platform) and on maintaining high levels of self-esteem during the period of compulsory education.

Because there are substantial differences between European countries in the size of the 'at risk' group in the population, its age composition and varying degree of attainment within the group, there can be no 'one size fits all' recommendation for a minimum platform or how it should be implemented.

Countries differ in the degree to which they have tackled prevention and remediation of low skills. For example Sweden has good policies in the area of prevention but does not do so well on remediation. In France and the UK, the reverse is the case. We therefore conclude that we need a set of policies that are flexible enough to enable the different European countries to produce policies 'tailor-made' to address their own set of problems and challenges.

What, then, are the features that a minimum learning platform policy should incorporate and the strategies that need to be considered for the policy to be effective?

A minimum platform should not just be a simple technical target concerned with 'employability'. Roberto Carneiro in a paper contributed to the Agora IV seminar organised by Cedefop in October 1998 considers that 'A minimum learning platform deals with all aspects of the human condition... A minimum learning platform is that threshold level – translated into knowledge and basic understanding of humankind – that allows for a personal quest for meaning' ⁽⁵⁾. Furthermore, a minimum platform should be informed by the set of values that individuals in all countries share by virtue of their European citizenship, in particular respect for human rights, the rule of law and democratic decision-making.

Policy also needs to take account of the current state of transition of European societies from an industrial mode of production to a knowledge-based society with the new skill requirements and new learning and information infrastructures that accompany that transition. Company case studies have yielded much evidence that failure to develop certain personal

⁽⁵⁾ Carneiro R *Achieving a minimum learning platform for all. Critical queries influencing strategies and policy options: Agora IV, The low-skilled on the European labour market: prospects and policy options – towards a minimum learning platform.*

qualities and social skills can be barriers to employment as well as handicaps in everyday life.

Finally, a minimum learning platform should be inclusive, i.e. open to all. This is perhaps the area where policy needs to be most radically rethought since the traditional approach to education has been characterised in a number of countries by successive exclusion at different stages of education and selectivity based on performance.

Policies should ensure learning entitlement for all citizens, making access to a minimum platform a realistic possibility regardless of conventional institutional constraints. This means that learning must be provided and supported not only during the early years of life but throughout life; it must not only be available in 'school' settings but outside conventional settings, for example in the workplace, the home and the shopping centre.

Traditional teacher-pupil relationships should be supplemented by using the potential of new information and presentation technologies. These technologies enable us to overcome the tyranny of time and distance and provide flexible learning opportunities. Private initiatives and enterprise should be liberated to respond to learning needs. The new learning structures and incentives should then form the basis for a permanent paradigm shift to a new social contract where the right to education is complemented by a new civic and social obligation to undertake learning and self-development throughout life.

There is already strong evidence in a number of countries of interest in promoting a 'minimum threshold level'. This is not always the term used, but there are striking similarities between countries. In the Netherlands there has been a lively policy discussion over the last five years on the so-called 'minimum starter qualification'. In Sweden there is a tradition that the curriculum of the compulsory school should aim to provide skills necessary for daily life rather than for working life.

Identifying the importance of personal and social skills or the 'softer skills' for effectiveness in the workplace has been an important feature of the debate about a minimum learning platform over the past 10 years. Adequate levels of literacy and numeracy are now seen as necessary for employability but only really effective if accompanied by a range of 'softer skills'.

In the UK, employer organisations have taken the lead in emphasising the importance of these skills. From September 2000, all post-16 students, those studying an 'academic' as well as those studying a vocational course, have been encouraged to obtain a qualification in specified key skills.

In Portugal, researchers working with the Ministry of Education have defined the desired profile of a young person at the end of 12 years of

education. This profile stresses citizenship, and social skills as well as academic attainments and has acted as a guide to the development of the curriculum. In France, targets have been set which have as their aim that all young people should obtain some qualification following compulsory schooling.

In all the countries considered here, some points of convergence are already apparent:

- (a) communication in all its forms, including quantitative literacy and self-presentational skills, are now considered to be necessary for employability. This requires a solid foundation of language competence and knowledge of basic mathematics;
- (b) in non-English speaking countries some ability to work in a foreign language, normally English is increasingly required – and achieved – for most employees;
- (c) in all countries emphasis is placed on familiarity and basic understanding of information and communication technology (ICT).

Personal and social skills are increasingly valued. These include:

- (a) the ability to learn independently;
- (b) the capacity to react to and deal effectively with uncertainty and unpredictability in the work environment;
- (c) the capacity to manage interpersonal relations successfully;
- (d) the ability to manage time and own work in an autonomous manner.

Skill levels of 'at risk' groups are increased not only by improving the quality and amount of initial education and training received, but by skill upgrading in employment or, if unemployed or inactive, through government-sponsored or self-sponsored individual learning initiatives. Informal workplace learning can also help to raise skill levels.

The Newskills project looked at how much training is provided in European countries to individuals in the workplace. This confirmed a common finding, namely that the least well-educated were least likely to receive employer-provided training. The exception was Germany where 70 % of training incidences are reported to be provided for this group. Most of this training was provided for young people in apprenticeship. Older employees were less likely to receive training, except in Sweden. Full-time employees were more likely to receive training than part-time employees.

One part of the explanation of why the least well-educated received less workplace training than other groups was provided by a study which used International Adult Literacy Survey (IALS) data on workers' and firms' decisions about training. This suggested that less-educated workers are more reluctant than other groups to take up such offers. We put forward a

number of possible explanations for this reluctance from Newskills case study experience and other case study work. One explanation put forward was that the 'at risk' group does not attach much weight to future benefits, i.e. they do not expect to gain higher wages or better jobs as a result of training.

The case studies confirmed this and found that less-educated employees do not normally receive higher wages following a period of employer-provided training. The UK was the only country where the Newskills case studies included a firm which paid higher wages to less-educated individuals who undertook training. So perhaps the less-educated workers are right to be suspicious if they are asked to give up time/wages to undertake training.

Another explanation put forward was that many low-skilled workers will have had an unrewarding school experience and have developed negative attitudes to learning. Training offered by employers or government training schemes will look like 'going back to school' and the consequent 'psychological cost' of overcoming negative attitudes will be higher than for groups with more positive attitudes developed during initial schooling.

4. Why school students stay on

The higher wages and higher employment probability associated with higher levels of education help to explain increasing participation in initial education and training by young people. However, the analysis of staying on in education by 16-19 year olds in the six EU countries in our study showed the increase in levels of academic attainment at the end of the lower secondary period to be a key variable associated with the rise in participation.

Early school leavers in Sweden who did not continue on to upper secondary education almost all had low and/or incomplete school marks. Compared to those who continued their education despite low school marks, the early leavers also more frequently had difficult home circumstances. Most of the other European countries studied showed a similar pattern. However, in Portugal, family poverty and the need for young family members to work to contribute to household income were important factors explaining dropout and failure to continue in school.

The promotion of social inclusion based on high levels of employment in high productivity economies is an important part of the European Social Agenda. This can only be achieved if greater priority is given to action to reducing as far as possible the number of citizens whose skills are inadequate for the demands of employment. Government policies must tackle inappropriate goals and values in school systems which neglect the

needs of a minority of students. Incentives for investing in learning should be made more transparent. Employers can create new learning opportunities by innovation and creative use of employees' skills. Trade unions can urge and support the provision of workplace training. Perhaps most important, each citizen can play a part by taking full advantage of the opportunities offered.

New challenges for low-skilled people: theoretical framework

Teresa Oliveira

Faculty of Sciences, University of Lisbon, Portugal

Youth unemployment remains one of the most serious problems in Member States, affecting particularly those who have difficulties in performing at school. There are implications for political, economic, social and educational issues. This has led to an enhanced view of competences. Key competences – rather than basic and technical skills – aim at the holistic development of the personality to prepare low-skilled people for the challenges of the future.

Situated learning highlights the social context of a learning situation and builds on the community of practice as a central element. The recognition of the individual knowledge and experience of the low-skilled reinforces the importance of education and training programmes adequate to the needs, values, cultures and lifestyles of the different target groups. The design and development of such innovative programmes require a different approach to the learning process, specifically oriented towards the low-skilled. For teachers, trainers and training institutions this is both a new challenge and an innovative situation.

The main goal of our discussion is to promote critical reflection on approaches to education and training for young low-skilled people in Europe. The conceptual framework of analysis is education because the work in this field is future-oriented and can prevent future mismatches in the labour market. Education plays a crucial, but ambiguous role in inclusion of young people and can be a springboard into the future.

1. Who are the low-skilled people?

Low-skilled young people are seen in relative and situational terms. Many suffer from multiple personal and social problems, including dysfunctional family backgrounds, experience of traumatic events, personality and behavioural difficulties (Stone et al., 2000). They are more likely than their peers to be involved in drugs and in crime (SEU, 1999). The policy attention devoted to them stems partly from concern for their welfare and partly from the social threat they are perceived to represent.

Many such young people are engaged in work, not within the formal economy, but within one or more of the three informal economies:

- (a) the household economy, covering production for internal consumption, within the home, of goods or services for which substitutes might otherwise be purchased for money;
- (b) the communal economy, involving the production of goods or services that are consumed by people other than the producers, but not sold on a monetary basis;
- (c) the hidden economy, involving work conducted wholly or partly for money which is concealed from taxation.

This group of young people changes track frequently, moving in and out of school, college, training schemes, jobs, and being unemployed (Hodkinson et al., 1996).

2. Education and social inclusion

Usually low-skilled people have a low level of education; this may result in social exclusion. 'Social exclusion' is a term replacing the traditional left-wing preoccupations with poverty, inequality and disadvantage. It is defined by Room (1995) as 'the process of becoming detached from the organisations and communities of which the society is composed and from the rights and obligations that they embody' (p. 243). Its intellectual roots lie in Durkheim's concern with the ways in which social inclusion, solidarity and social cohesion can be effected in advanced industrial societies (Levitas, 1998). The concept of social exclusion has also exercised growing influence on social and economic policy within the European Union. Nowadays we speak of social inclusion instead of social exclusion.

2.1. Social inclusion

Social inclusion is a process, not a state, characterised by diversity. Every aspect of inclusion – definition, motives, aims and levels – shows a large diversity in practice. Citizenship is closely linked to social inclusion that could be translated as professional insertion and inclusion in continuous training. Multiculturalism, the concept of citizen in a global society, human rights and interrelationships and inclusion in society are subjects that need research both in formal and non-formal settings. For research to start, there must be agreed frameworks of what constitutes inclusion; without this diversity becomes chaos.

As European initiatives extend opportunities to formerly marginalised groups for greater involvement in the mainstream of society (Meijer et al., 1994) there is a need to develop clear understandings of concepts, what inclusion actually offers to marginalised groups and how different processes of inclusion achieve their outcomes. At present it is consensual that inclusion supports the humanist view of equality of opportunities for all. It is a right, not a privilege and marginalised groups will be offered increasing participation in the mainstream of human affairs. This view is further skewed by differing status among groups of low-skilled people and if we focus on outcomes, the general question of how we benefit them through inclusion. Inclusion will always be seen as philosophically justified but impossible to achieve in practice (Rispen, 1994). For inclusion to succeed on its own terms, we must have clear understandings of what outcomes inclusion can provide and how they can be realised in practice; here research can provide the data for policy decisions.

The role of inclusion is mainly preventive, helping young people to avoid social exclusion, and reintegrative, supporting those currently excluded in gaining access to education/training and the labour market. In its preventive role, it can, for example, clarify the links between education and the achievement of vocational goals, and prevent ‘false moves’, which lead to failure and undermine future participation. In its reintegrative role, it can operate directly to support educational participation and to include individuals in the labour market, as well as operating collaboratively with other agencies in contributing to holistic multi-agency approaches to address multiple disadvantage (Killeen, Watts, 1999). In addition, Morgan and Hughes (1999) identify a recovery role, aimed at bringing young people back into learning provision specifically designed to meet their needs (this is perhaps best seen as a ‘stepping stone’ within the reintegration role of helping them into mainstream provision).

Inclusion also offers the possibility of altering societal attitudes towards the low-skilled. For marginalised groups, demarginalisation can either take place

through assimilation i.e. changing the individual to become more like the dominant group, or by acceptance by the dominant group. This view has overtones of paternalism and it is questionable whether such a process of inclusion would support real attitude change in the dominant group to allow full group participation by the minority (Meijer et al., 1994).

The social-ethical view of inclusion talks of 'opportunities' within a 'rights' discourse, which may change attitudes. Within this broad policy frame, particular attention has been addressed to young people who have dropped out of education, training and employment. In regular schooling, in particular, the chief basis for organisational control is the promise that 'If you work hard and pass your exams, you'll get a (good) job.' The premise underlying this promise is much more valid in the bureaucratic sectors of the labour market than in its entrepreneurial sectors. The problem is that low-skilled people are marginalised from regular schooling, presenting a lack of competences that impedes the effective schoolwork even if they work hard.

Data from research suggests a strong commitment to workplace training programmes as providing access to 'education for empowerment'. Low paid workers can access various education opportunities, providing them with a potential of real life skills and understanding of their current position. They can also participate to a greater extent in the community, in political and learning activities outside the workplace setting.

2.2. Education

Throughout the 1990's learner-centred learning environments, such as ICT and computer-mediated communication (CMC), and didactic approaches, such as problem-based, project-based, cognitive apprenticeships, constructivist learning environments, goal-based scenarios, and situated learning, have focused more on what they afford learners for effecting their way of learning and thinking, rather than transmitting information from teachers to learners (Land, Hannafin, 2001).

Learner-centred learning is supported theoretically by various overlapping pedagogical concepts such as self-directed learning, student-centred instruction or learning, active learning, vicarious learning, cooperative learning and learning in context of real work. For example, self-directed learning involves dimensions of process and product referring to four related phenomena: personal autonomy, self-management, learner-control and autodidaxy. All these dimensions are present in learner-centred learning where the locus of control is shifted from teacher to the learner.

Learning tasks in learner-centred learning environments include such techniques as substituting lectures with active learning experiences, holding

students responsible for material that has not been explicitly discussed in class, solving open-ended and real problems requiring critical and creative thinking, and using self-paced and/or cooperative learning. The research findings of educational literature prove convincingly that properly implemented learner-centred learning fosters intrinsic motivation, increases effort for learning, elicits deeper understanding toward the subject being taught, provides the learner with valuable real-life skills and develops competences (Felder, Brent, 2001). Both affective and cognitive factors play a significant role, especially for low-skilled people.

Central to this learner-centred model is the notion of 'situated learning' which places learning in the context of the lived experience. The holistic view includes whole-person learning, an approach that addresses the whole individual mind – within the framework of situated learning – covering emotion, sensation and action (Lave, Wenger, 1991). The mind has to be addressed in a learning situation to transform learning into 'effective' learning. It describes the engagement of the cognitive, affective, somatic and intuitive elements of an individual in learning (Evans, Hoffman, 2000). The activity of each learner and the world mutually interacts and combines individual and social learning. Social learning is learning in the context of a 'community of practice' that enables and supports personal/social learning (Wenger, 1999). One of the advantages for low-skilled people of the 'situated learning' approach is, that here the creation of knowledge and the acquisition of skills is embedded within a context that reflects the learner's situation, a real-life situation. Situated learning provides multiple perspectives of the world and the possibility of changing roles and functions.

Learner-centred learning is based on construction of the knowledge process by the individual where every 'new' knowledge is anchored in previous knowledge. The specific form of constructivist theory is under continuous debate, but researchers agree that the following characteristics are included: learner construction of meaning (von Glasersfeld, 1995); social interaction to help individuals learn (Vygotsky, 1978); and learner problem-solving in real work contexts. Bonk and Cunningham (1998), as many authors, suggest that we are able to examine motivational issues, such as meaningfulness of studies and self-regulation of learning, in more detailed level from the constructivistic point of view. This thought is supported also by Leflore (2000) who argues that the constructivist approach offers a suitable theoretical base for learning. For low-skilled people the constructivist perspective is crucial. The previous knowledge and experience are highlighted instead of eliminated.

3. Competences

In modern society the development of professional activity is a main source of social-professional inclusion. The growing number of young people who leave school before finishing the compulsory education without any professional qualification is a worrying question for society. For low-skilled students to get a professional qualification is a complex process. In the end most of them become low-skilled workers.

This has led to an enhanced view of competences. The discourse on key competences is, usually, very much economy-oriented. Key competences are assumed to open up career choices, in other words to enhance the individuals' employability and reaction with greater flexibility to the changing needs of the labour market. However, their relevance does not result from enhanced or reduced employability but rather from the question of social inclusion or exclusion. Key competences – rather other than basic and technical skills – aim at the holistic development of the personality to prepare low-skilled people for the challenges of the future.

To improve the effectiveness and efficiency of investment in inclusion of low-skilled people it is necessary to help them in the construction of their personal life project. The flexibility of training models, could be the starting point for empowering them for lifelong learning, developing competences as communication, responsibility, autonomy, interpersonal relationship, socialisation, working in a team, solving problems, learning how to learn and how to think (Oliveira, Frazão, 2002).

There are appropriate policy measures and programmes but these have had little impact on early school leaving and have not yet achieved their goals. Some degree of modesty is needed in setting expectations for such programmes. Then, care needs to be taken, in planning the programmes, to start from the assumption that the disengagement of young people may not be pathological but be based on a rational response to their structural situation (Piper, Piper, 1999). However, current vocational training and related activities, based on formal training organisation and on the idea that individuals have a willingness for learning, do not satisfy the low-skilled. They are not able to prevent youngsters from dropping out or to implement efficient measures to develop key competences (Niemeyer, 2000).

A certificate course becomes part of the formal system and is likely to receive funding and continued support. However, low-skilled people are unable to participate in formal training. It is necessary to introduce a new perspective of training, 'new' teachers and trainers, and effective guidance in

an informal setting. Research projects and dissemination of the results should be reinforced and the information about programmes and activities provided to low-skilled people.

4. Training teachers and trainers

There are important political and ethical issues about training, but there are also practical issues. If teachers, trainers and career advisers are to be able to intervene effectively with young people who have dropped out of the formal system or are at risk of doing so, they need to understand, and to be prepared to work within, the subjective frame of reference of the young people with whom they are working (Niemeyer, 2000). As Coles (1995) puts it, they need to be not only experts in training or in local labour market intelligence but also 'ethnographers of local youth culture' (p. 83).

For the teachers and training institutions the challenge demands new roles. These new roles imply new methods of teacher/trainer training, accepting that the 'others' are persons with different cultures and values. Diversity could be seen as enrichment for our own culture and not simply a problem of tolerance.

We argue that the implementation of teacher and trainer training for low-skilled people, within a constructivist framework, needs the context of situated learning organised in communities of practice, with real engagement of teachers and trainers in their own training (interactive social learning) (Oliveira, Frazão, 2002).

Those involved in offering training to young people who have dropped out of formal education, training and employment, or are at risk of doing so, are unlikely to be effective unless they address the reality of the current lifestyles of such young people and are able to do so within the young people's own perspective. Training in context is the recognition that teachers and trainers must be located and engaged in context-experiencing situations, managing the concepts, meanings, understandings, beliefs and values. Training in communities of practice allows teamwork structured by different elements of educational society with mutual acknowledgement and sharing of diversified knowledge. The following points are crucial:

- (a) reflective training (questioning, researching, justifying and reformulating);
- (b) differentiation of training for specific tasks of teachers and trainers as well as the development of their new competences and roles as tutors, counsellors, mediators, etc.;
- (c) more flexible and non academic training, in graded steps, leading

- teachers and trainers to reflexive attitudes regarding the possible contribution that the society might demand from them; curricular organisation of training in modular structure and project work;
- (d) training outside school at workplace and at social activities to be aware of low-skilled students expectations regarding re-enter initiatives;
 - (e) development of national networks and transnational projects (Oliveira, Frazão, 2001).

Bricker (1978) offers a rationale of teacher training from three points of view. The first is for the training agents to act as referral points for the target-group to access formal training. The second is concerned with outreach: for the formal training services to develop new methods for working with the trainers' training agents and with the target-group itself. The third focuses on competence building: helping the agents to be initial deliverers to the target-group. This can be carried out through training programmes designed to develop the competences of the training agents (Watts, McCarthy, 1998).

The traditional teacher/training models should become more innovative, based on research projects. The implementation of an innovative initiative to achieve institutional change in teacher and trainer training is not easy. It is a developmental and learning process, which necessitates persistence, motivation and financial support. Thus, the institutions have to decide whether or not to change in order to accommodate the specific needs of those who work with low-skilled people.

The basic problem seems to be related to the institutional ethos, motivation, existing evaluation practices and awareness of their culture of change if new models and environments of learning like 'situated learning' are to be implemented. The challenge is to persuade institutions at different levels that work in this field is crucial and is not a marginal issue. It is necessary to implement policy, develop procedures and create infrastructures to allocate status, time, and resources for building appropriate curricular and teaching material for specific groups at risk of marginalisation and socioeconomic exclusion.

5. Conclusion

Educational breadth is essential to personal growth, to early identification of skills needs and as preparation for future changes in career and work. Key skills should be incorporated, but personal and group learning should go well beyond these. The goals of learning must derive from broader frameworks, providing learners with the means and capacities for interpreting experience

and for acting in the wider social world, while understanding the sources of diversity and differentiation within it (Evans, 1998).

It is necessary to find adequate solutions for the problems that low-skilled student face. Classroom situations and school certificates have frequently been a constant source of bad experiences for low-skilled people. A downward spiral of lack of success with learning can only be broken by completely different learning surroundings (Niemeyer, 2000). When we focus on the low-skilled students, the causes of drop out are found both in external factors outside education (complex family situation, migration etc.) and within education. Important aspects include redesigning the curricula (defining specific aims, sequence, methodology, assessment in a framework of a flexible and interdisciplinary curricular organisation); structuring the learning environment (supports, equipment, timetables, cooperation with other schools, enterprises and social organisations); teacher/trainer training appropriate to the target group; training of tutors both at school and at the enterprise; and implementing of an efficient guidance, counselling and assistance system (formal and non-formal).

A situated learning environment promotes reflection to enable abstraction and self-determination. Reflection serves to analyse and evaluate personal situation and circumstances, to make sense of the personal situation and to create meaning and understanding. Learners are 'forced' to focus on their thought process and to reflect upon it. Reflection is a very important attribute of the environment as it represents an opportunity to articulate, negotiate and defend certain issues, positions and knowledge.

A situated learning environment provides an 'authentic' context that reflects the situation of the learner. This understanding of environment is not restricted to the world of work, or life environment, but also to situations, beliefs, and values. The 'authentic' context represents the full complexity of the situation without fragmentation; it is all-embracing. The great advantage of this approach is that the learning environment does not have to be artificially constructed to employ principles and elements of a situated learning approach, but is already present and in use within the community of practice in which the learning environment is formed and detected. The community of practice embraces the context and sets free a learning environment. At the same time 'space' is being created and thus provides an opportunity for engaging the participants within the community of practice.

Situated learning for the low-skilled seems easier in informal settings where cooperation of interdisciplinary teams inside and outside schools (trainers, tutors, counsellors, social workers, reintegration officers, employment centres etc.) find less constraints in supplying the necessary

measures and activities to get these youngsters into education and the labour market.

Outcomes of training should be framed in terms of 'graded steps' which are valuable in relation to achieving viable and socially legitimate lifestyles outside the formal system, as well as enabling low-skilled people to move towards the formal system as and when they wish to do so (Watts, McCarthy, 1998).

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Linking quantitative and qualitative prospects for ‘low-skilled’ jobs

Géry Coomans

*Institute of Mathematical Sciences
and Applied Economics (ISMEA), France*

Quantitative prospects for labour supply across the enlarged EU for the two decades ahead are estimated, down to regional NUTS2 level, using a low scenario and a high scenario. The low scenario assumes constant behaviour, i.e. constant activity rates by gender (two groups), age (five groups) and educational level (three groups). The high scenario assumes that for each of the 30 groups employment rates could progressively rise to the highest national levels reached in 2000, leading most EU-25 regions to an overall employment rate close to 80 % by 2020, defining their potential growth of employment by gender, age and education. The calendar and geography of the pressure suggests that most of south and eastern Europe will lack dramatically young qualified labour either to feed overall employment growth or to diffuse productivity growth. The main policy implication lies in the need to speed up the implementation of lifelong development of competences as a condition of future economic growth.

Starting from constant activity rates by age groups and educational level ⁽¹⁾ as given by the 2000 Labour Force Survey, from current demographic projections ⁽²⁾, and from the shift in distribution of educational attainment and age (considering 10-year interval groups), one can build 'constant-behaviour projections' of the labour force. Results considered as conservative, or showing a 'low' scenario in which no improvement would occur, are given in the table below. They include both a demographic effect and an educational effect, but ignore any increase in activity rates for any given age/educational group.

Table 1. **Change in the size of the labour force by the level of educational attainment (*) 2000-2010-2020 (in %), (age group 25-64)**

EU-15	Low	Medium	High	Total
2000-2010	-15	10	12	3
2010-2020	-17	3	4	-2

8 accession countries (Cyprus and Malta excluded)	Low	Medium	High	Total
2000-2010	-27	6	9	2
2010-2020	-25	-10	-7	-11

(*) Assumptions: constant 2000 activity rates by gender, 10-year age groups and the level of educational attainment (low, medium, high).

Source of data: 2000 activity rates as in Eurostat LFS 2000.

Demographic projections: for EU-15, Eurostat 2000 baseline scenario;

for accession countries: UNO, WPP 2000 rev., medium variant.

Quoted from G. Coomans, *Atlas of prospective labour supply*, 2003.

⁽¹⁾ Age groups referred to are 15-24, 25-34, and so on to 55-64. In case of data on educational attainment the youngest age group of 15-24 is excluded. Educational levels are ISCED based: low = less than upper secondary = ISCED 0-2; medium = upper secondary = ISCED 3; high = ISCED 5-7 = tertiary, i.e. upper secondary + at least 2 years fulfilled in higher education. Definition changes in the UK in the late-1990s, by which 'O levels' were to be considered as upper secondary, have ended up in lowering the age at which upper secondary is attained by half of the young people down to 16.3 years, against an EU-15 average lying at 19 years, jeopardising full comparability.

⁽²⁾ Demographic projections are either, for the EU-15, the Eurostat 2000 Demographic Projections, Baseline Scenario and, for all other countries in Europe, the UN World Population Prospects, 2000 Revision, Medium variant, 2000, or, at any sub-national level, our own projections, as in G. Coomans, *Atlas of Prospective Labour Supply*, forthcoming in winter 2003-04, based on 1995-2000 changes by gender and age, including 5-year interregional mobility. The 1997 Eurostat Regional Demographic Projections, based on 1995 data, cannot be used anymore, after significant shifts appeared between the projected data and the 2000 observed data, shifts that are mainly due to the non-integration of the mobility by age.

The table suggests that both in the EU-15 and in the new Member States, overall labour supply would remain close to stability in the present decade, and be reduced in the next decade by 2 % for the EU-15 and by 11 % for the new Member States (excluding Malta and Cyprus). But the main change would occur in supply of people with low educational attainments, where the reduction would be significant, even in the present decade. This low level of educational attainment is also where further activation of inactive people could change the picture, while the already high employment rates and low unemployment rates of people with high educational attainment leave hardly any reserve to activate above the present rate. Mapping these changes at regional level (NUTS2) shows how the demographic and educational effects spread over the EU. They show that regional inequalities are considerable, and that local bottlenecks could subtract more from overall growth.

Demography by itself would reduce – all other things remaining constant – overall labour supply, with fastest decline concentrating north and east of Bordeaux, with only Lithuania, Poland (and only outside the old industrial regions), Romania and Slovakia showing significant residual growth. In the Nordic countries, residual growth is concentrated on the capital regions. Besides Ireland, other growth areas are found in south-west Greece and southern Spain.

Mapping the educational shift (meaning that improved educational levels attained by every young incoming generation lead to increased labour supply, given that improved education means higher activity rates) shows impressive increases in Greece, Spain, Ireland, and Italy, and to a lesser extent in France. All these countries are catching-up on north European standards, with young women performing now significantly better than men. Past progressions, involving further favourable shifts while the working age population is ageing have been slower, with incomplete catching-up by women, in Germany and Austria, Switzerland and other countries. In eastern Europe, where the progression has long concentrated on attaining very high levels at an upper secondary level but with levels of tertiary still lagging behind significantly (except in Lithuania), the shifts are most positive in the capital region of Bulgaria, Hungary and Lithuania, and the western regions of Poland and Slovakia. They were much slower in the ex-DDR and Romania.

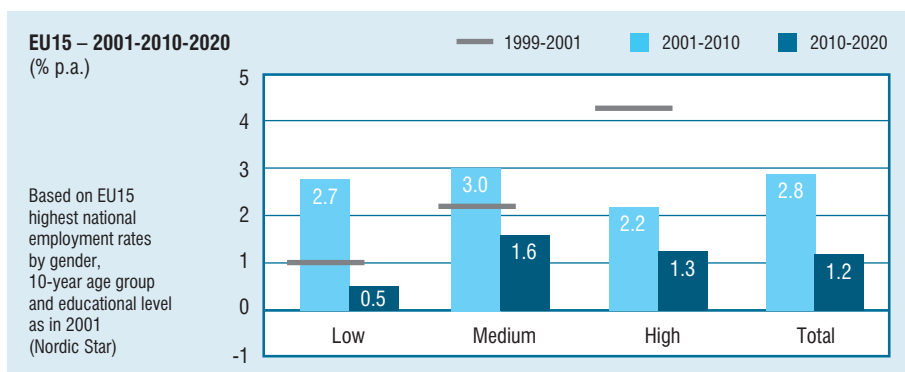
Mapping the combined effect of the demographic shift and the educational shift provides an illustration of how the decline in labour supply will spread over the present decade, starting from the central regions of Europe. In the following decade (2010-20) this decline will progressively generalise, with most negative shifts in eastern Europe, but also in the northern regions of Spain, Italy, Finland and Sweden, while Germany, given its different past

demographic calendar, shows a more limited decline over the second decade.

A high scenario can also be applied by considering the best performances in employment rates by age groups and educational attainment ⁽³⁾. For example, if the good practises of EU-15 highest employment rates for the 55-64 age group with medium educational level as in Sweden were applied everywhere by 2010, this would give the maximum employment rate and employment level, and also potential employment growth ⁽⁴⁾. In fact, depending on age structure and distribution by educational level, it would bring all regions to an overall employment rate that would lie close to 80 %, some 10 % above the Lisbon target. This employment growth should certainly be considered as an aspirational view, relying on the assumption that Europe would progressively generate high levels of employability for all.

It must first be remembered that in recent years (1999-2001), the EU-15 has been able to increase employment by close to an annual 2 %, and that this covered a mix of an annual 4 % growth for those with tertiary attainment, 2 % for the medium level, and 1 % for people with low educational attainment. We have to remember this 1-2-4 ratio, as it suggests that sustainable growth relies on a high share of additional supply of tertiary level labour, and a low share of low educated labour, if any. And things might happen here as with the Liebig Barrel, where any resources above the proper mix of nutrients are simply lost. In other words, the risk is that, unless new flexibilities are invented, the availability of the more scarce factor dictates overall growth.

Figure 1. **Potential employment growth**



Source: ISMEA database

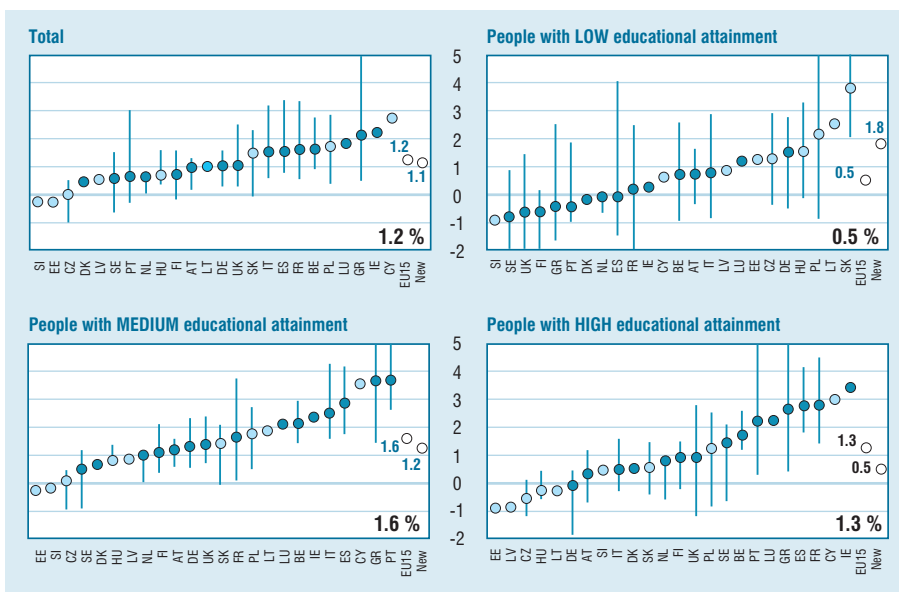
⁽³⁾ Named the 'Nordic Star' performance, it applies the 30 best (2 gender x 5 ten-years age groups x 3 educational level into Low, Medium and High) national employment rates to the corresponding groups as projected in 2010 and 2020 for every region.

⁽⁴⁾ Under the condition that the number of available jobs would grow accordingly.

The prospects for the EU-15, along a 'virtuous Nordic Star' pattern by which employability would be enlarged, are the following: for the present decade, no more than an annual 2.2 % growth of labour supply at tertiary level could be attained, and no more than an annual 1.3 % for the 2001-20 period (Figure 1).

The charts below (Figure 2) show the equivalent potential annual growth rates of employment depending on educational attainments in every EU-25 Member State. It suggests, for example, that additional labour supply at the tertiary level is to remain high in Cyprus, France, Ireland and Spain, all countries that showed high employment growth in recent years. In contrast, most new Member States are focused on the lower end, where we find also Germany and Italy, with insufficient supply of highly qualified labour. The chart referring to the potential growth of employment for people with low educational attainments suggest that most new Member States have in prospect an excess supply of lowly qualified people. In all regions where an excess supply of lowly qualified labour force is accompanied by a short supply of medium and high qualified labour force, improving the employability of people with low educational attainment should be prioritised.

Figure 2. **Potential annual employment growth rates by the level of education in EU-25 (2000-2020)**



Source: ISMEA database

Another aspect must be considered here: age distribution of the supply by level of education. The ideal situation would be that most people at tertiary level were young, bringing in updated knowledge and higher inclination for organisational innovation and that people with low educational attainment were older, in such a way that they could be retired rather than unemployed. The second best would be that labour intensive activities would locate where the availability of low or medium qualified labour is available, resulting in the best local trade-offs.

Mapping the age distribution of the supply of people with low educational attainment shows also that the younger groups with low attainment are reduced much more than it is the case for the ageing workers.

At the upper end, the supply of younger people (aged 25-44) with tertiary attainment is to decline over the next two decades in most of the EU, with the exception of Greece, Spain, France and Ireland and a limited number of scattered regions. This designates the area where growth could remain more sustained.

Concluding remarks

In the view of a both shrinking and ageing labour supply, the question of overall and local skill shortage is to become a permanent concern, as it has already become a concern of many employers. Although pure demographics do not suggest that the USA should feel more concerned at short notice, sensitivity and analysis seem in the USA to be ahead of what they are in the EU ⁽⁵⁾.

At this stage, the behaviour most likely to produce high sensitivity to the impending demographic changes seems to be related to two patterns. First, stop-and-go recruiting has produced unbalanced age distribution that dramatically hampers future recruitment. Second, low professional profiles, meaning unfavourable working conditions, wages and/or career prospects, are likely to appear increasingly unattractive. If a stop-and-go recruitment policy cannot be avoided because of financial constraints, most efforts will have to involve the progressive improvement of professional profile, opening a new era after two centuries of abundant young labour supply.

In this framework, recruitment and employee retention will need adaptable and innovative HR management, changing job requirements for employees

⁽⁵⁾ See typically some very interesting analysis in the Electronic Recruiting News in E-mail (ERNIE) at <http://www.interbiznet.com>, more particularly the ERNIE dated 25 May and 28 July 2003.

and job assessments. One of the major changes is likely to derive from the need not to rely to the same extent on certified capabilities but on the recognition of both codified and tacit knowledge and on the problem-solving and learning capacities within the 'learning organisation' that will determine productive efficiency. The concept of low qualification is being progressively questioned, because it tends more and more to remain consistent only in outdated organisational forms based on disciplinary assignment to Fordist jobs ⁽⁶⁾. In this respect, the lifelong development of competences may have no better ally than the need to remain competitive in a phase of demographically shrinking and ageing labour supply. Even at world level, this trend seems so irreversible that there is no risk in betting that the companies themselves will progressively organise the internalisation of lifelong learning. But progressive changes do not mean fast changes, and no change is without cost. The cost here is the multiplication of local and sectoral bottlenecks, bringing economic development below its potential.

⁽⁶⁾ See in particular Paul Santelmann, *Qualification ou compétence. Pour en finir avec la notion de travail non-qualifié*, Editions de l'Organisation, 2002.

Identification of transversal competences and qualifications

Summary and conclusions

Tiina Annus

PRAXIS Center for Policy Studies, Estonia

The questions at the outset of the workshop discussion ⁽¹⁾ focused on two main areas:

- (a) which are the skills needed to cope with the rapid spread of information and communication technologies and increasingly computerised working environments?
- (b) what are the consequences of social, structural, technological and demographic change of our societies, and the associated changes of skill needs and demand, particularly for low-skilled workers?

The first question considered opportunities to enrich and enhance work by using ICT as well as associated social and economic challenges. The question is closely linked to the one on disparity in skills distribution among workers and to restructuring and adaptation of vocational training systems under the conditions of skill-biased change.

In the fast-changing world of work, where companies need employees with experience and high level know-how, lifelong learning is becoming part of our everyday life. It is hard to achieve the ambitious goals of the European Union and economic prosperity without highly educated people. Today, when communication and networks with rapid development in ICT, and the use of, and work with, computer-controlled systems increasingly becomes an integral part of every-day work, education and training do not stand for accomplishment of professional knowledge alone.

The example of the analysis of job advertisements in the information technology sector in Germany showed that recruiting companies criticise the

⁽¹⁾ See contributions in this volume by Niitamo, Steedman, Oliveira, Coomans and Bott, presented at the workshop.

lack of the combination of professional knowledge and pronounced soft skills as an essential deficit in qualifications of applicants. Nowadays an employee is expected to have a good combination of soft skills, with professional knowledge in all occupations across different economic sectors. These transferable or generic skills are combined with creativity, application and user skills, ability to cooperate, to work in teams, to communicate and to learn.

Technological change, and in particular the fast developing information and communication technology (ICT) sector, also offers new opportunities for all sectors. However, at the same time they require more and more employees with specific technical skills for a given sector. An initiative at European level – the Career Space programme – was set up to put in place a clear framework for students, educational institutions and governments. It described the roles, skills and competences required by the ICT sector in Europe. Thirteen ICT job profiles relevant to the sector and guidelines for new ICT curriculum were elaborated in cooperation with more than twenty universities and educational institutions across Europe to assist the design of courses aiming to match skills profiles and needs. Furthermore, a website (www.career-space.com) has been established to provide more information about the ICT industry and skills requirements.

Shortage of qualified workforce is a measure of quantity (supply and demand, equilibrium and balance), skills gap is a measure of quality (quality of skills, education, training and lifelong learning). Looking in more detail, from the supply side, the building of ICT skills should start at an early age and strong capabilities in mathematics, science and informatics are preconditions to becoming highly skilled professionals in the future. On the demand side the monitoring of ICT job trends and the evaluation of educational supply are necessary initial steps based on a multilateral partnership approach involving individuals, public and private organisations. However, there is no unique model for partnership. Different company cultures, industries and even countries create different models of partnerships. But their aim is the same: to equip people with the ICT skills needed for tomorrow.

The second issue of the discussion was concerned with the increasingly precarious situation of low-skilled people in the labour market and ways to impart future-oriented and basic skills expected to make low-skilled people employable and able to cope with changing requirements.

The Newskills ⁽²⁾ group concluded that the labour market situation of low-skilled people (i.e. with educational attainment below upper secondary level

⁽²⁾ Newskills project was carried out in six countries (Germany, France, the Netherlands, Portugal, Sweden and the UK), the final report available at <http://158.143.98.51/homepage/tser/>

– ISCED level 0-2) in Europe will continue to be difficult, involving a high risk of social exclusion. Demand for low-skilled people is falling, traditional sectors of their employment are in decline. Even in a situation of improving education and training attainment, about 20 % of the population will continue to fall into the category of the low-skilled.

The research undertaken points to a number of policy failures over the last years, the major one being that schools in European countries continue to ‘produce’ young people with useless skills. Young people have not learned how to learn, there is the lack of core (key) competences and some of those who leave initial education have developed an aversion to learning. The disastrous results of this become visible in the reluctance to ‘go back to school’ to continue studies and training. As this disadvantage affects mostly young people, it is necessary to intervene at an early stage. There are several policy challenges, such as to construct working partnerships with learning providers outside the school, offer individualised guidance and support at critical periods during schooling and allow the construction of flexible routes to qualifications.

People with a low level of skills can become skilled by opening learning opportunities, flexibility and adaptability and through good interpersonal skills, all developed by a combination of formal and non-formal work-based and situational learning. The community of practice and youth culture have an important role to play, and they need to be taken into account in training provision for the low-skilled young.

Low-skilled adults in employment are not primarily the problem of the government; they are primarily the problem of employers. However, this can change easily when those ‘at risk’ drop out from employment and become unemployed. A preventive policy will need additional funds to upgrade existing skills and change current attitudes. Furthermore, incentives should be provided to take advantage of learning opportunities offered by employers and to work in a challenging environment where learning on the job is regular part of working life. Social partners and stakeholders can support low-skilled adult workers in improving their qualifications by combining employment and learning at the workplace, creating new learning opportunities and providing financial support.

The general conclusion of the workshop discussion was that, in spite of a constantly growing number of people who already have high-level ICT skills, there is still a significant proportion of young people leaving school with low self-esteem, unwilling to continue to learn. The big challenge for education and training is that it must remain attractive for adults as well as find ways to ensure that all young school leavers are willing to go on learning.

PART VI

Early identification
of skill needs in Europe:
conclusions
and perspectives

Contributions in Part VI

Ulrich Mittag

**The need for, and shaping of,
a European network of activities
on early identification of skill needs**

Ginette Manderscheid

**Synthesis of responses
to the questionnaire on setting up an early
identification of skill needs network**

Manfred Tessaring

**Early identification of skill needs:
European activities and perspectives**

The need for, and shaping of, a European network of activities on early identification of skill needs

Ulrich Mittag

Federal Ministry of Education and Research (BMBF), Germany

This article considers the development of a European network for early identification of skill needs against the background of current discussion on networks. The potential objectives of such a network are presented and conclusions are drawn, taking into account framework conditions and specific objectives.

The paper advocates analysis of the status quo of existing initiatives and activities for early identification of skill needs in Europe. This analysis of the status quo forms the basis for development of the network. Three different network models are presented in this context: the control model, the coordination model and the exchange of information model. All models are tested for their suitability for a network on early identification of skill needs. An evaluation of the network is recommended as a necessary precondition, to develop continuously and improve the network against the different demands being made. Evaluation criteria are presented in this context. Finally, the contribution makes some practical remarks on how the objective of establishing a European network on early identification of skill needs could be achieved.

Discussion so far has revealed the wide range of the early identification initiatives in Europe, including the acceding countries. In addition to methodological questions, exchanges of experience have focussed on the transfer of results into policy and practice.

The meeting continues along the lines of the objectives set by the first expert conference in Berlin in May 2002. Both conferences have pursued the aim of supporting the establishment of a European network on early

identification of skill needs. Both meetings have thus followed a trend which is advocated by a growing number of players in education and research, as well as in technical, economic and social fields. The establishment of knowledge-based networks is spreading. Due to the different use of the terms 'net' and 'network', the term 'network' will be briefly defined as it is used in this contribution, dealing with the shaping of a European network.

1. Description of networks

The term network describes an open, decentralised, social, symmetrical interaction which is based on trust, permeability and distributed competences and resources (Faulstich, 2002, p. 21). If the sentence 'Networks are an expression of social integration' is true, joint objectives are needed – as in any form of integration – and not commands or hierarchical dictates (Trier et al., 2003, p. 100 et seq.). Joint objectives, common interests, trust and mutual recognition facilitate the establishment of networks. Networks are based on consolidating communicative relationships among their players.

Networks can be international as well as purely national, or may even work in the form of so-called closed shops. There is a broad variety of possible forms. It is therefore necessary for the players to discuss common interests, objectives and organisational structures before establishing a network.

What is the difference between such networks and traditional research collaborations? To my understanding collaborations – as opposed to networks – are binding for cooperating partners. A collaboration is formalised by contractual, binding regulations on the rights and duties of all parties, the duration of the collaboration, etc. (Faulstich, 2002, 23f.)

By contrast, a network is characterised by continuous interaction between players on a voluntary and informal basis, while coordination centres or coordination points provide support (Weyer, 2000, p. 122).

Against the background of the objectives which we are pursuing and the possibilities provided by the establishment of networks, I believe the chances for successfully establishing an early identification network at European level are good.

1.1. Objectives of networks

Since (learning) networks are characterised by a high level of information, the wish for exchanges of experience, and a reduction in uncertainties, the establishment of a network must first provide a basis for continuous communication, which facilitates joint analysis and solution of problems.

Second, cooperation is intended to realise synergies, to exchange examples of best practice and to avoid the possible duplication of work or repetitions of research support.

Third, a network should provide extensive possibilities for critical reflection and evaluation of results.

The specification of objectives and shaping of the network depend on the players in the network and on who might potentially benefit from it.

1.2. **Players in the network on early identification of skill needs**

Potential players in the network on early identification of skill needs are researchers, on the one hand, and representatives of industry, on the other, who are responsible for qualification development.

Representatives of industry in this sense include workers' representatives, in so far as they have an interest in the field.

Beneficiaries of the network will be researchers and the social partners as well as education policy-makers, education providers, industry in general and possibly also individuals taking decisions on education. All can benefit from the information provided by such a network.

The various players and beneficiaries of the network pursue different interests, so that the structure of the network can change according to priority.

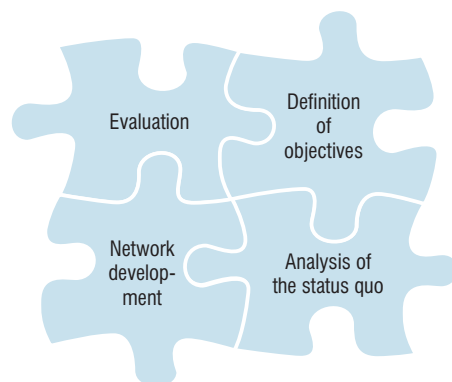
2. **European network on early identification of skill needs: considerations of structure**

The definition of objectives is the start of strategic considerations. What objectives are to be pursued by a future European network on early identification of skills needs? This requires an analysis of the status quo of existing projects and collaborations that might be included in the future network.

The establishment of the network should finally be linked to an evaluation. The evaluation must fit into the overall concept and contribute to the continuous improvement of the network.

The diagram (Figure 1) shows the process of network development. It also shows that the network should not be understood as the so-called closed shop, but should be linked with existing networks.

Figure 1. **The network processes**



2.1. Definition of the objectives of the network on early identification of skill needs

The network should be characterised by an open dialogue and an exchange of best practices and methods of early identification of skill needs. This objective is of great importance because of the sometimes limited national methodological possibilities of early identification of skill needs. Reference is made, in particular, to the heated discussion in Germany on the possibility or impossibility of determining quantitative labour market demand.

For the qualitative area, however, the German Federal Ministry of Education and Research (BMBF) has established a basis for exchanges on different methods under the Initiative for Early Identification of Qualification Needs (*Initiative zur Früherkennung von Qualifikationserfordernissen*). The BMBF wants to continue the dialogue with other European researchers initiated at the expert meeting in 2002.

However, the following objective is most important: encouraging the transparency of the results achieved in different countries. Similar or identical results gained in different countries may be considered relatively reliable. European networking facilitates the detection of similar or identical skill and qualification developments and makes it possible to take these trends into account nationally or regionally.

The processing and transparency of the data collected, however, depends on the criteria according to which information is structured. Differentiation by country, target group (e.g. user), industry or occupation, for example, would be appropriate.

Under the first objective, researchers are active players in, as well as users of, the network in terms of developing methods, providing research results

and sharing experience. The second objective focuses on the recipients of information, i.e. industry, the social partners, players in education policy, education institutions and individuals, and on transfer of research results into policy and practice.

As a third objective, there is a need for open information exchange about activities in early identification of skill needs, including evaluation of various approaches.

Finally, the network should facilitate easy contacts and should have a structure that simplifies decisions on participation.

While objectives one and two imply specific procedures in establishing the network, objectives three and four are still vague as regards the form of open exchanges and contacts. However, all the objectives must be determined within this framework. This means specifically, for example, that all the information pooled in the network must be target-oriented, as in an individual career decision or a decision on education policy.

All information in the network must be sufficiently reliable and must be processed in such a way that it can serve as a basis for the specific target group, for example decision-makers in education.

This structure can be supported by a coordinating body (to be created).

2.2. Analysis of the *status quo*

Numerous initiatives and activities for the early identification of skill needs do exist in Europe and the OECD countries. An extensive overview of such initiatives was provided in Manfred Tessaring's article in the publication which resulted from the 2002 workshop (Tessaring, 2003, p. 347 et seq.).

His observations reveal that early identification is no longer an isolated issue.

Existing activities must be pooled and networked.

One example is the collaboration of the ETF (European Training Foundation) and Cedefop, which, together with some EU and accession countries, pursue the goal of developing scenarios for development of vocational training using Delphi methodology. Several hundred education experts per country have been interviewed about their views within the framework of this study.

In addition, the Institute for Prospective Technology Studies (IPTS) launched the Futures project in 1998. The project is intended to generate information on trends in demography, society, economy, qualification and technology, and to point out their impact on competitiveness and employment by 2010. A core group of experts and decision-makers in industry, science and politics has been established. The project formed the starting point for

cooperation between IPTS and ESTO (European Science and Technology Observatory), which looks into the impact of technologies on the economy and employment in the EU.

FISTERA (Foresight on Information Society Technologies in the European Research Area) is an industry-based network. Its objective is to map technological trends and the resulting demand for new information and communication technologies in an information society.

LABOURatory is based on a Leonardo da Vinci project. Forecasting methods, which are also applicable in the transition economies of central and eastern Europe, were developed within this network of different international experts.

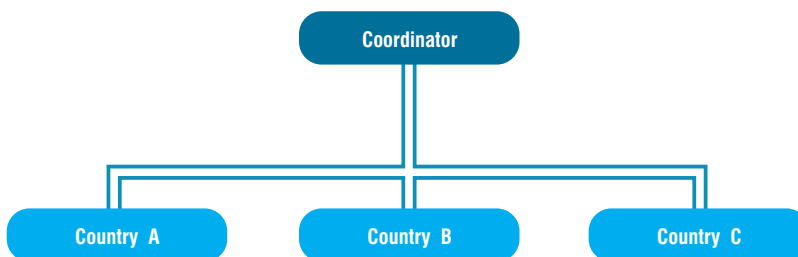
Finally, mention is made of the FreQueNz network, which was initiated on the basis of a common agreement with the social partners. So far, this network has dealt with defining qualitative demand and with the specific implementation of the results in practice.

Following the analysis of the status quo, for which the publications by Tessaring (2003) and Gülker et al. (2000) form an excellent basis, proposals must be made for the structure of the network.

2.3. Development of networks

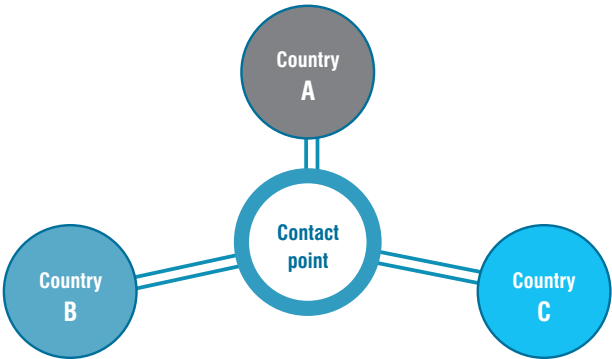
Presented here are three models based on Faulstich, Vespermann and Zeuner (2000).

Figure 2. **Control model**



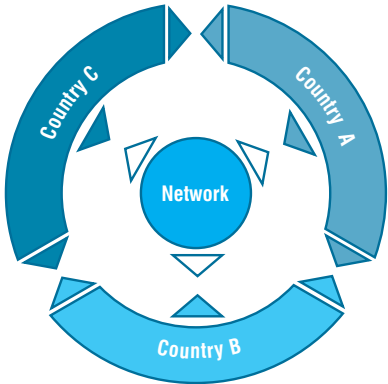
Within the framework of the control model (Figure 2), a coordinator exercises leading control over the network, setting objectives or giving orders. This model is too *dirigiste* against the background of pluralistically organised collaboration in Europe.

Figure 3. **Coordination model**



The coordination model (Figure 3), in contrast, is based on exchanges of results and experience in an agreed structure and form. These exchanges must be coordinated by a central body, where all information flows together. In this model, the contact point has the task of gathering information and making it available to all the players. It can also point out that results are still missing or that research is needed, so that common decisions and further evaluations can be prepared. This body should, therefore, have a transregional, even international character, if possible, and have a definite infrastructure with the necessary resources.

Figure 4. **Exchange of information model**



The simplest form of networking is the exchange of information model (Figure 4). This network is based on organising the flow of information and on the option to post information independently. The only necessary prerequisite is an information platform, for example via the Internet, linking existing platforms and databases. In this sense, the BMBF-financed homepage of the FreQueNz network might also be linked with the European platform. Players should post their information in selected languages only, in order to ensure a high degree of transfer.

The results of studies of early identification of skill needs could be collected and presented according to specific criteria focused at, for instance, specific industries or regions.

Taking into account the present conditions, I propose to opt primarily for the exchange of information model. After evaluation of the overall system, and with the agreement of the players, reorganisation along the lines of a coordination model can eventually be initiated.

2.4. Network evaluation

Evaluation should be based on the following criteria:

- (a) the network quota, i.e. a representation of the frequency with which the network is used;
- (b) the range of cooperation, i.e. an analysis of the extent of all forms of cooperation;
- (c) the range of services, i.e. a description of all the service options offered in the network;
- (d) the performance level, i.e. an analysis of the performance of the network;
- (e) orientation towards trends, i.e. in how far this network can recognise and take up new trends in the early identification of skill needs.

3. Final remarks

The FreQueNz platform is available to support initial steps towards a European network in cooperation with Cedefop. I would like to invite all interested individuals and organisations to participate in laying the foundation for a project which will benefit us all. Joint interaction is becoming increasingly important against the background of the intensified discussion in the EU on the development of joint qualification standards. A European network not only creates transparency in future economic developments, but also contributes to securing quality in vocational education and training.

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Synthesis of responses to the questionnaire on setting up an early identification of skill needs network

Ginette Manderscheid

*European Centre for the Development
of Vocational Training (Cedefop)*

The conference on the Early identification of skill needs in Europe closed with a roundtable discussion on European cooperation on early identification of skill needs. The discussion focused in particular on specific requirements and implications for policy, practice and research. Participants were later invited to respond to a questionnaire, which aimed to gauge the level of support for, and expectations of, a network on early identification of skill needs in Europe.

The participants who also responded to the questionnaire were:

- Mr Sergio Corti from the European Commission (DG EAC);
- Ms Diedrich-Fuhs from German Employers' Organisation for Vocational Training (KWB);
- Mr Christoph Ehrenberg from German Federal Ministry of Education and Research (BMBF);
- Mr Hans Heijke from Maastricht University (ROA);
- Mr Jochen Laux from DGB (the Confederation of German Trade Unions);
- Mr Rupert Maclean from UNESCO/UNEVOC;
- Mr Veli-Pekka Niitamo from NOKIA;
- Mr Claude Sauvageot from French National Ministry of Education.

The discussion confirmed the clear interest in establishing a European-level or even international network on early identification of skill needs that would bridge research, policy and practice. While the responses reflected a broad range of institutional and organisational perspectives (researchers, policy-makers, social partners and the business world) some convergent key points emerged.

First, the network should foster research by providing a forum for discussion and exchange on approaches, research methods and outcomes, with the European dimension bringing in the added value of comparative

analysis. The network, however, may go beyond European boundaries both to foster the level and quality of research in Europe and to transfer knowledge and good practice examples to other countries.

Second, transferring research outcomes to policy and practice is seen as a central element of the success of such a network. To this end, the network should develop and implement a strategy to make results from early identification projects and initiatives available to relevant stakeholders, i.e. those involved in developing training offers or training users (social partners, policy-makers, training providers, enterprises and individuals). These outcomes would be discussed with the interested parties, thus ensuring that the needs of stakeholders are reflected in the research agenda. Taking this one step further, the network could, and should, contribute to improving cooperation between research, and policy and practice by providing focussed guidance and advice as well as high quality information to the stakeholders at the relevant levels.

Third, the network should be a forum for information sharing and sharing of best practices and innovations, including lessons from not entirely successful activities. It should help increase transparency as to skill needs in various branches and occupations across countries.

It was broadly agreed that this new network should build on already existing structures in the field, with optimal pooling of resources. Cedefop, for its part, should take on the lead role in establishing the network, initiating and facilitating network activities, stimulating projects and partnerships, linking up to other networks and ensuring the dissemination of outcomes in a structured way. The focus would be on thematic workshops and expert meetings with a reasonable number of participants, along with larger biennial conferences.

A range of proposals on the content of network activities were put forward, reflecting the stakeholders' particular backgrounds and perspectives. In line with the network's European and international orientation, the relevant sectors and branches (e.g. tourism, new technologies) could be included as a matter of priority, with the close involvement of relevant partners (e.g. ETF, ILO, OECD, UNESCO-IIEP). Methodological approaches would be another primary focus of research and knowledge exchange among highly qualified experts, who might aim to develop medium to long-term forecasts and scenarios as an information base for national and European policymakers and other networks.

The round table participants were also asked in the questionnaire how they or their institutions can contribute to the network. While this was contingent on the ultimate setup of the network, there was a clear commitment by all to bringing their respective strengths to bear, with offers ranging from support in the design of the network to bringing in results, contacts and existing networks.

Early identification of skill needs: European activities and perspectives

Manfred Tessaring

*European Centre for the Development
of Vocational Training (Cedefop)*

This paper discusses the objectives, delimitation and approaches of activities on Early identification of skill needs at European level. In particular it calls for a proper demarcation of skills, qualifications and competences, the areas of interest (e.g. sectors, occupations, regions), the time horizon and target groups. Furthermore, the transfer of findings into policy and practice has to be ensured to attain legitimacy and valuation and thus to contribute to the future shaping of vocational education and training. The paper concludes with some proposals for future cooperation at European and international levels, such as concrete collaboration between research teams and a network which could be established by Cedefop.

1. Objectives of early identification initiatives

The main objective of initiatives on the early identification of skill needs is to modernise vocational education and training by taking into account the skill needs of people as well as of enterprises and the economy. Official statistics and forecasts – their usefulness for policy being undoubted – will rarely be able to detect new emerging skills required at work. They have to be complemented by bottom-up approaches focusing on particular sectors, regions, occupations and target groups.

The need to identify new skills emerging at work, within organisations or local labour markets, arises from the aspiration to provide companies with skilled workers for new tasks and, at the same time, to impart new skills to people in order to become or stay employable. Another impetus for a future-oriented reform of education and training is high and persisting unemployment, accompanied by simultaneous job vacancies and skills

shortages. This structural unemployment is, as numerous research studies reveal, mainly caused by mismatch between supply of and demand for skills, and/or by mismatches at regional level. Against this background, research on early identification of skill needs seeks to find empirical evidence on new skills that are emerging within organisations and labour markets. Research findings can feed and support respective policies to provide these skills at a broader level, either by introducing new skill profiles in public and private training or by reforming or restructuring existing training profiles in initial and continuous training.

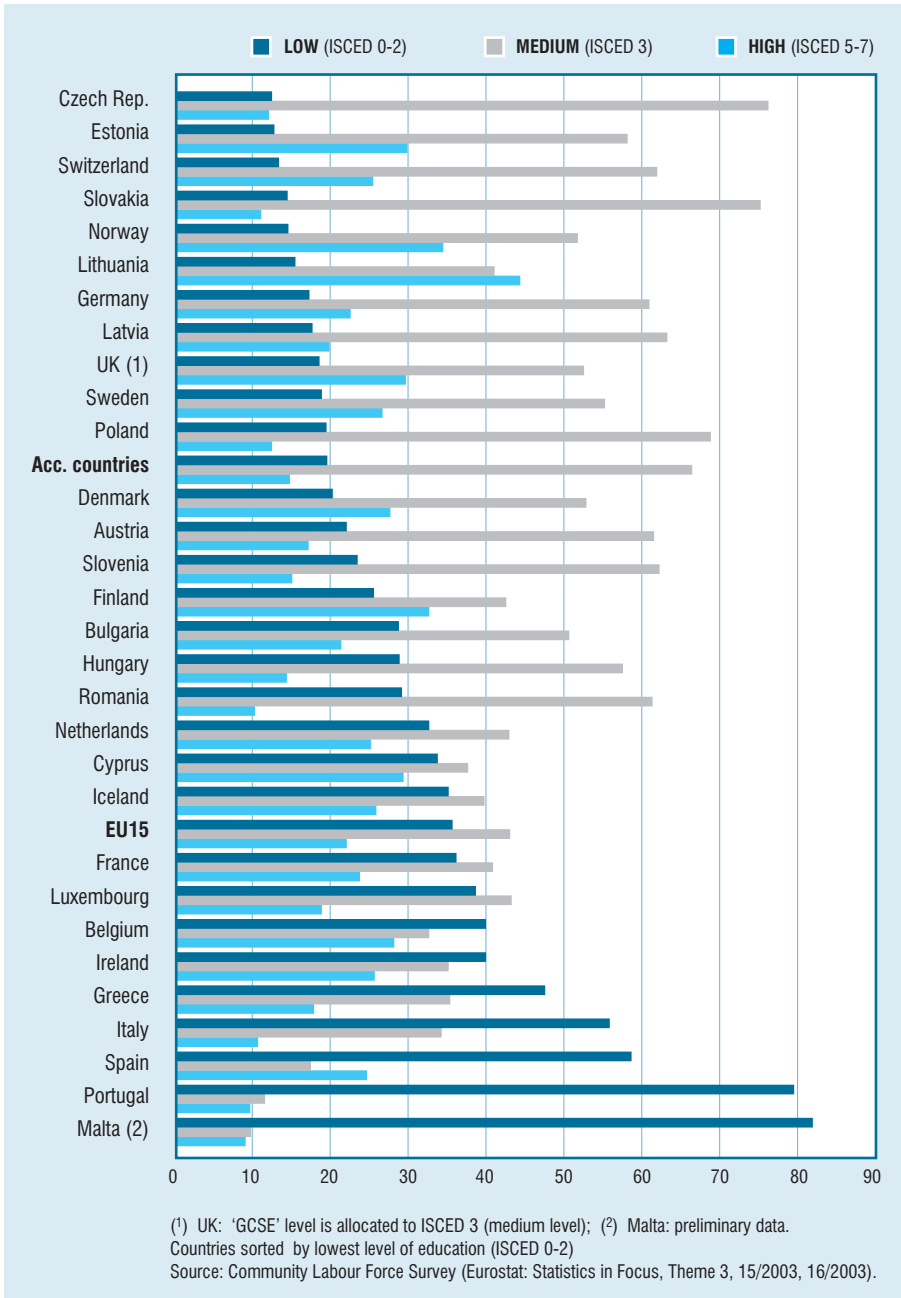
Thus, the early identification of skill needs intends to provide information for all those involved – individuals, companies and other training providers – which is suited to their decision-making on training choice and training investments. They are also useful for policy-makers and other stakeholders – including the social partners – in their efforts towards appropriate reshaping of the organisation, venues and curricula of training.

By doing this, individual and social costs of misallocation might be reduced, and individuals, companies and the economy could keep pace with rapid socioeconomic change. This is at the same time, an important way of reducing labour market mismatches and avoiding future unemployment caused by structural distortions between skill profiles and requirements. Equally, such an approach is basis for providing companies with ‘modern’ workers, avoiding frustration and costly reorientation, and contributing to innovation and competitiveness of companies and the whole economy.

2. Educational attainment in Europe

The need to upgrade the skills of our populations becomes obvious when comparing the educational attainment of the working age populations in European countries (see Figure 1). Although this figure provides only a general picture of the skill structure in Europe and does not indicate skill contents and requirements, the overall dimension within which education and training policies – as well as skill analyses – have to operate becomes obvious. According to a number of international surveys such as the EU Labour Force Surveys by Eurostat or the International Adult Literacy Survey (IALS) carried out by the OECD, educational attainment at upper secondary level (ISCED 3) has become the minimum requirement for the access to qualified jobs. The figure illustrates the considerable differences in skill levels across Europe. In the southern European countries in particular, the proportion of lower skilled people exceeds 50 %. Impressive, though not

Figure 1. **Educational attainment of the population aged 25-64 years
2002 in Europe (in %)**



really surprising, is the low proportion of low-skilled people in almost all accession and candidate countries, as compared with the EU-15 average.

The figure gives a first, rough impression of the efforts needed to upgrade the skills of the European population. This is also a subject of European benchmarks to be achieved by the year 2010 in order to realise the target set by the European Council in Lisbon (2000) for the European Union to become the most competitive and dynamic knowledge-based economy in the world. One of those benchmarks, related to skills upgrading, was quantified by the Education Council in May 2003. It states that by 2010 at least 85 % of 22 year olds in the European Union should have completed upper secondary education. This benchmark refines a previous benchmark proposed by the European Commission in November 2002 which asked Member States to ensure by 2010 that the EU average percentage of 25-64 year olds with at least upper secondary education reaches 80 % or more.

3. Delimitation

What is early identification of skill needs about, and what distinguishes this exercise from numerous similar ones carried out in anticipation and forecasting of skills, skill needs analysis and assessment, etc.? In view of the variety of approaches used in European countries it appears necessary to define properly the focus of such activities in terms of their subject, location, time horizon, target groups and kind of measures. The following aspects do not aim to provide an answer to all these questions. Instead, they address some issues which should be considered when respective activities are carried out.

Subjects of the early identification of skill needs could be the skills, qualifications and/or competences of people which need to be adjusted and updated. Individuals should be enabled to cope with ever-changing and unforeseeable requirements and situations at work, but also in other relevant spheres of life. We have to be aware, however, that skills, qualifications and competences are not easy to define. Their notion differs substantially from one country to another not only in terms of their substance, but also in terms of linguistic and semantic definitions. The following proposes some definitions of competences, skills and qualifications ⁽¹⁾.

⁽¹⁾ See the glossary of VET (Tissot, P. *Glossary on identification, assessment and recognition of qualifications and competences* in Bjørnåvold, J. *Making learning visible: identification, assessment and recognition of non-formal learning in Europe*. Luxembourg: Office for Official Publications of the European Communities, 2000 (Cedefop reference).

‘Competence’ is defined as the personal capacity to perform a work task in a given context. Competence denotes the ‘proven/demonstrated’ individual capacity to use knowledge, know-how, skills or qualification to meet usual and/or changing occupational situations and requirements.

The notion of competence may include formal as well as non-formal qualifications and skills. It equally may include elements such as the capacity to transfer skills and knowledge to a new occupational situation or the capacity to innovate. The level or kind of competence may be assessed by evaluating the individual’s ability to use his/her skills.

‘Skills’ include the relevant knowledge and experience needed to perform a specific task or job. Skills may be the product of education, training and experience acquired both in a formal or non-formal way. The notion of skills refers to, and partly overlaps with, other basic concepts such as competence, qualification, knowledge and ability. The imprecise scope of this concept makes its translation into other languages not easy.

‘Qualification’ denotes the requirements for an individual to enter or progress within an occupation. It also denotes an official record (certificate, diploma) of achievement which recognises successful completion of education or training, or satisfactory performance in a test or examination.

The concept of qualification varies from one country to another. It may express the ability – formally defined in work contracts or collective agreements – to perform a certain job or meet the requirements of the workplace. A qualification may give rise to a number of rights and prerogatives which determine the individual’s position within the hierarchy of his/her occupational context.

The second question concerns the location of skills ⁽²⁾. Investigations in the framework of early identification of skill needs can be carried out at national or European level, in regions and local labour markets, in industrial sectors and branches, in companies – both large ones and SMEs – and within occupations or occupational fields. Normally, these areas overlap. Thus, for example, an investigation could be directed towards new skill needs in management within the tourism sector in, say, a Greek island. The question then would be whether the findings are transferable or representative also to other occupations within this occupational field, to neighbouring sectors (e.g. gastronomy and catering) and to other Greek islands, the whole country or regions in other countries.

The time horizon also has to be considered: are the skills detected and identified expected to be sustainable? This is one of the most crucial

⁽²⁾ We will use the term ‘skills’ hereafter, encompassing competences and qualifications.

questions because new skills to be imparted should be durable for a long time and not affected by short- and medium-term fluctuations of business cycles or fashions. This also touches upon the character of skills: are they specific or broad, limited to certain jobs/companies or transferable? Another important aspect to be considered is the time lag between the identification of new skills, the formulation of reforms, their implementation and the time until the first 'cohorts' with these new skills enter the labour market. Dependent on the country and its training system, the involvement of stakeholders in reform and legal and institutional settings, a time lag of up to 10 years might elapse until new skills become available on the labour market.

Furthermore, the target group has to be defined properly. Should new skills be imparted to all people of working age, to workers only, to the unemployed, to people at risk, or to younger or older people only? This question is linked with identifying the appropriate means to impart new skills. These could include reform of curricula of existing training occupations, a combination of existing training profiles or a completely new training scheme. Reforms can be allocated – depending on the country's training system – to initial vocational training, to continuous training or to retraining. They could refer to training modules, non-formal training measures outside the workplace, or on-the-job training. Finally, the question of financing arises: who benefits from these new skills and who should pay?

4. Approaches

European countries, with their diverse education and training systems and cultures, have developed and applied various approaches to get a glimpse of the future and to identify, monitor and anticipate new and changing skill needs. Approaches range from case studies, company surveys, expert inquiries and forecasts to scenarios and observatories at regional, national and supranational level. Skill audits, focus groups and benchmarking exercises are further activities in this and neighbouring fields.

These approaches are partly complementary and partly substitutive. They use different methods which can be more quantitative or more qualitative by nature. Furthermore, they have different time horizons and different degrees of representativity, generalisation and differentiation. In addition, the involvement of stakeholders is different, ranging from, for example, a top-down approach in traditional forecasting, with little involvement, to bottom-up approaches with a strong involvement of stakeholders in expert inquiries or skill audits.

In the recent past, there has been a tendency to develop more ‘holistic’ approaches which combine quantitative data (based on statistics, surveys or forecasts) with qualitative information, e.g. derived from expert ratings, Delphi inquiries or ‘foresight’ studies.

Furthermore, it is essential to explore whether the ‘new’ skills detected are really new ones, or whether they are only a new label for traditional qualifications and job requirements. For example, analyses of job advertisements may find that, for marketing reasons, companies are rather creative in inventing new labels for traditional jobs. Also, new skills found in a particular country might have a long tradition in other countries.

In addition, a substantiated judgement is necessary on whether the new or changing skills identified are expected to be sustainable in the longer run or just volatile, and whether they offer job opportunities on a large-scale or only in niches. If these requirements are not met, a wrong course will be set and – because of the long time horizon within which education and training policies have to operate – long-lasting misallocations could be the result.

A last, yet most important, question relates to the transfer of findings into policy. Policy-makers, once the results are on their table, have to take a number of decisions when it comes to implementation of new training schemes or to curricula reforms.

It is most important for any skill needs exercise to be legitimate, that is to be acknowledged and valued by its ‘clients’. To this end, the activity as well as its analysis, should be based on theory and should uncover its implicit and explicit assumptions. Criteria to be applied are relevance, reliability and accuracy to ensure both internal and external validity. This refers to the selection and use of appropriate methods and to the transferability of results to other related areas, regions or sectors.

Social and political legitimacy will only be achieved if those responsible for reforms and interventions are convinced of the relevance and robustness of approaches and findings. The most promising way to achieve this is the timely involvement of all relevant stakeholders in an early identification of skill needs project. This leads to a number of subsequent issues to be solved if the policy transfer should be successful. Quality assessments and the training of teachers and trainers in these new skills are important issues. Last but not least, because all information on the future is uncertain and subject to continuous change, regular monitoring and evaluation exercises are necessary to improve programmes and initiatives and to judge their success. This refers to formative evaluation in the course of programme implementation as well as to summative evaluation of its impacts and benefits, compared with costs.

5. Situation in Europe and features of cooperation

Some European countries have extensive experience of early identification of skill needs, whereas others have just started. A wide range of approaches is used, but there are still considerable deficiencies concerning methods and data. This reflects not only different infrastructures for empirical research but also differences in the support of respective activities by policy, in terms of financial assistance and organisational backup.

Cross-country transparency and cooperation should be intensified, both to learn from other countries and to make one's own experience available to others. Below, some issues are addressed briefly which should be considered once more intense European cooperation in early identification of skill needs is agreed.

5.1. Exchange of information

The first aim of closer European cooperation in early identification of skill needs activities is to achieve more transparency across countries. This refers to mutual exchange of information on emerging trends and requirements in different sectors, regions and occupations. The importance of transparency applies not only to sectors and occupations which face similar changes in different countries, but also to those areas which explicitly include 'cross-border' activities. Examples of the first area are new emerging technologies such as fuel cell technologies, optical, biotechnologies and nanotechnologies and their implications for future skills. However, more traditional fields like manufacturing, handicraft sectors and personal services are also affected by changing skill requirements. Examples for the second field of cross-border activities are tourism, transport and logistics, and environmental protection. Here, challenges and solutions are not likely to differ substantially between countries.

5.2. Exchange of experts and collaboration

Another form of cooperation refers to the exchange of experts, researchers and trainees as well as to concrete collaboration on particular projects. The organisation of this kind of exchange could be managed by the institutions concerned or within the framework of, and supported by, European programmes, particularly those which foster cross-border mobility.

A similar means of intensifying cooperation and exchange could be study visits by stakeholders – policy-makers, administrators, social partners, training providers, etc. – to other countries. This kind of programme has successfully been carried out by Cedefop within the framework of Leonardo

da Vinci. Particular focuses of study visits could be to inform stakeholders of related activities in the host country and thus to raise their awareness towards respective needs in their own country.

5.3. Networking

A basic tool for put reinforced exchange and cooperation into practice is establishing a European network which is open to all – researchers, policy-makers, practitioners and social partners – active in early identification of skill needs. The importance and success of such a network has been demonstrated, for example, by the German FreQueNz network (www.frequenz.net) which has existed since end of the 1990s and comprises a considerable number of partner organisations and institutions working in early identification of skill needs, also including experts in other countries.

The creation of a European or even international network on early identification of skill needs should build on the experiences gathered in other networks and should be linked to all relevant national and supra-national networks. Networking activities should be based both on physical contacts and electronic tools.

Major biennial conferences could present and discuss work progress, new challenges, ideas and approaches as well as important findings. Workshops could be held on specific topics, organised in rotation by network members at different places. These workshops could deal with a particular subject which will be discussed at expert level. Both conferences and workshops should be documented and their proceedings should be made available to all network members and to the broader public. Normally, however, these meetings need financial support and organisational backup by policy, e.g. national ministries, social partner organisations, or EU bodies.

One could also consider a regular reporting series on new trends in skills and qualifications in Europe, to be drafted in close cooperation with network members and based on their contributions. This report could be published both as a hardcopy and electronically.

A European website on the Internet should be created as a ‘virtual community’. Cedefop is willing and prepared to realise this if human and financial resources are provided. This website should be accessible to all network members; more general information should also be presented to the broader public. The website should provide the following features:

- (a) contact and information database on network members: institutions, organisations, experts;
- (b) information by network members on projects and activities, concerning both research and policy;

- (c) announcements of relevant conferences and workshops and upload of conference materials;
- (d) documentation database on published and grey literature on early identification of skill needs, with regular updates;
- (e) platform for interactive discussion and exchange of ideas, cooperation needs and suggestions, including announcements on vacancies, traineeships, calls for tender and the like;
- (f) publication of a regular newsletter to be published electronically and accessible to a broader public.

The national consortia that have been built up by Cedefop in the framework of its Network for reference and expertise (ReferNet) could play an important role in identifying stakeholders and supporting activities on early identification of skill needs. Relevant information will also be entered into the knowledge management system (KMS) which is currently being established by Cedefop.

However, a number of questions and problems will have to be solved in establishing such a network. Problems range from translation of documents and other information to be uploaded to personnel and material resources to be provided. What is most important, however is that these networking activities will not work out well without the cooperation of all members and without solid and longer-term organisational and financial back-up. Whether and how to approach this aim, whom to involve and how to organise such a network is one important issue to be discussed on this conference and during its follow-up.

NB: In the meantime this network has been established at Cedefop. It is called Skillsnet and is open for both network members and the broader public. The network can be accessed via the European Training Village (www.trainingvillage.gr) under the section Projects and networks.

List of contributors

Lothar Abicht

Institut für Strukturpolitik und
Wirtschaftsförderung (isw) / Institute
of Structural Policies and Economic
Development
Halle (Saale), Germany
E-mail: abicht@isw-institut.de
www.isw-institut.de, www.frequenz.net

Tiina Annus

PRAXIS Center for Policy Studies
Tallinn, Estonia
E-mail: tiina@praxis.ee
www.praxis.ee

Peter Bott

Bundesinstitut für Berufsbildung
(BIBB) / Federal Institute for Vocational
Training
Bonn, Germany
E-mail: bott@bibb.de
www.bibb.de, www.frequenz.net

Norbert Bromberger

Forschungsinstitut für Berufsbildung
im Handwerk an der Universität
zu Köln (FBH) / Research Institute
for Vocational Education and Training
in the Crafts Sector at the University
of Cologne
Cologne, Germany
E-mail:
Norbert.Bromberger@uni-koeln.de
www.uni-koeln.de
www.frequenz.net

Mike Coles

The Qualifications and Curriculum
Authority (QCA)
London, United Kingdom
E-mail: ColesM@qca.org.uk
www.qca.org.uk

Géry Coomans

Institut des Sciences Mathématiques
et Economiques Appliquées (ISMEA) /
Institute of Mathematical Sciences
and Applied Economics
Paris, France
E-mail: gery.coomans@easynet.be
<http://www.ismea.org>

Sergio Corti

European Commission,
DG Education and Culture
E-mail: sergio.corti@dg22.cec.be
www.europa.eu.int/comm

Helen Diedrich-Fuhs

Kuratorium der Deutschen Wirtschaft
für Berufsbildung (KWB) /
German Employers' Organisation
for Vocational Training
Bonn, Germany
E-mail:
Diedrich-Fuhs@kwb-berufsbildung.de
www.kwb-berufsbildung.de

Bernd Dworschak

Fraunhofer-Institut für Arbeitswirtschaft
und Organisation (Fraunhofer IAO) /
Fraunhofer Institute for Industrial
Engineering
Stuttgart, Germany
E-mail:
bernd.dworschak@iao.fraunhofer.de
www.pm.iao.fhg.de
www.frequenz.net

Christoph Ehrenberg

Bundesministerium für Bildung und
Forschung (BMBF) / Federal Ministry
of Education and Research
Bonn, Germany
E-mail:
christoph.ehrenberg@bmbf.bund.de
www.bmbf.de, www.frequenz.net

Friedrich Hubert Esser

Forschungsinstitut für Berufsbildung
im Handwerk an der Universität
zu Köln (FBH) / Research Institute
for Vocational Education and Training
in the Crafts Sector at the University
of Cologne
Cologne, Germany
E-mail: f-h.esser@uni-koeln.de
www.uni-koeln.de, www.frequenz.net

Henriette Freikamp

Institut für Strukturpolitik und
Wirtschaftsförderung (isw) / Institute of
Structural Policies and Economic
Development
Halle (Saale), Germany
E-mail: freikamp@isw-institut.de
www.isw-institut.de
www.frequenz.net

Mario Gatti

Istituto per lo Sviluppo della
Formazione Professionale dei
Lavoratori / Institute for the
Development of Workers' Vocational
Training (ISFOL)
Rome, Italy
E-mail: m.gatti@isfol.it
www.isfol.it

Hans Heijke

Research Centre for Education and the
Labour Market (ROA)
Maastricht University
Maastricht, The Netherlands
E-mail: h.heijke@roa.unimaas.nl
www.fdewb.unimaas.nl/roa/home.htm

Sibylle Hermann

Fraunhofer-Institut für Arbeitswirtschaft
und Organisation (Fraunhofer IAO) /
Fraunhofer Institute for Industrial
Engineering
Stuttgart, Germany
E-mail:
sibylle.hermann@iao.fraunhofer.de
www.pm.iao.fhg.de
www.frequenz.net

Christoph Hilbert

Wissenschaftszentrum Berlin für
Sozialforschung (WZB) /
Social Science Research Center Berlin
Berlin, Germany
E-mail: hilbert@wz-berlin.de
www.wz-berlin.de
www.frequenz.net

Olympia Kaminioti

Employment Observatory Research –
Informatics S. A. (PAEP)
Athens, Greece
E-mail: okaminioti@paep.org.gr
www.paep.org.gr

Ioannis Koukiadis

European Parliament
E-mail: lkoukiadis@europarl.eu.int
www.europarl.eu.int

Jochen Laux

Deutscher Gewerkschaftsbund (DGB) /
The Confederation of German Trade
Unions
Berlin, Germany
E-mail: jochen.laux@bvv.dgb.de
www.dgb.de

Rupert Maclean

UNESCO/UNEVOC
Bonn, Germany
E-mail: R.Maclean@unevoc.de
www.unevoc.unesco.org

Ginette Manderscheid

European Centre for the Development
of Vocational Training (Cedefop)
E-mail: gma@cedefop.eu.int
www.cedefop.eu.int, www.trainingvillage.gr

Ulrich Mittag

Bundesministerium für Bildung und
Forschung (BMBF) / Federal Ministry of
Education and Research
Bonn, Germany
E-mail: ulrich.mittag@bmbf.bund.de
www.bmbf.de
www.frequenz.net

Ralf Mytzek

Wissenschaftszentrum Berlin für
Sozialforschung (WZB) / Social Science
Research Center Berlin
Berlin, Germany
E-mail: mytzek@wz-berlin.de
www.wz-berlin.de
www.frequenz.net

Loek F. M. Nieuwenhuis

Stoas Research
Wageningen, The Netherlands
E-mail: lni@stoas.nl
www.stoas.nl

Veli-Pekka Niitamo

Global Strategic Resourcing, Nokia
Finland
Supply-Demand Task-Force,
Career Space
E-mail: Veli-pekka.niitamo@nokia.com
www.career-space.com

Teresa Oliveira

Faculdade de Ciências da Universidade
de Lisboa / Faculty of Sciences,
University of Lisbon
Lisbon, Portugal
E-mail: mto@fc.ul.pt
www.fc.ul.pt

Ioanna Panopoulou

Ministry of Labour and Social Affairs
Athens, Greece
E-mail: labor-kp@otenet.gr
www.labor-ministry.gr

David Parkes

European Institute of Education and
Social Policy (EIESP)
Paris, France
E-mail: parkes@wanadoo.fr
www.eiesp.org

Jordi Planas

Institut de Ciències de l'Educació (ICE)
– Universitat Autònoma de Barcelona
(UAB) / Institute of Educational
Sciences – Autonomous University
of Barcelona
Bellaterra (Barcelona), Spain
E-mail: jordi.planas@uab.es
www.ub.es/ice

George Psacharopoulos

Hellenic Parliament
Athens, Greece
E-mail: gpsach@otenet.gr
www.parliament.gr

Peter Rigney

Irish Congress of Trade Unions (ICTU)
Dublin, Ireland
E-mail: peter.rigney@ictu.ie
www.ictu.ie

Claude Sauvageot

French National Ministry of Education
Paris, France
E-mail:
claude.sauvageot@education.gouv.fr

Eleonora Waltraud Schmid

European Centre for the Development
of Vocational Training (Cedefop)
E-mail: ews@cedefop.eu.int
www.cedefop.eu.int
www.trainingvillage.gr

Susanne Liane Schmidt

Fraunhofer-Institut für Arbeitswirtschaft
und Organisation (Fraunhofer IAO) /
Fraunhofer Institute for Industrial
Engineering
Stuttgart, Germany
E-mail:
Susanne.Schmidt@iao.fraunhofer.de
www.pm.iao.fhg.de
www.frequenz.net

Klaus Schömann

Wissenschaftszentrum Berlin für
Sozialforschung (WZB) / Social Science
Research Center Berlin
Berlin, Germany
E-mail: klaus@wz-berlin.de
www.wz-berlin.de
www.frequenz.net

Hilary Steedman

Centre for Economic Performance
(CEP), London School of Economics
London, UK
E-mail: h.steedman@lse.ac.uk
www.lse.ac.uk

Gudrun Steeger

Bundesministerium für Bildung und
Forschung (BMBF) / Federal Ministry of
Education and Research
Bonn, Germany
E-mail: Gudrun.Steeger@bmbf.bund.de
www.bmbf.de, www.frequenz.net

Olga Strietska-Ilina

National Observatory of Employment
and Training, National Training Fund
Prague, Czech Republic
Since October 2003: European Centre
for the Development of Vocational
Training (Cedefop)
E-mail: ost@cedefop.eu.int
www.cedefop.eu.int
www.trainingvillage.gr

Heikki Suomalainen

Union of Industrial and Employers'
Confederations of Europe (UNICE)
E-mail: heikki.suomalainen@tt.fi
www.unice.org

Manfred Tessaring

European Centre for the Development
of Vocational Training (Cedefop)
E-mail: mt@cedefop.eu.int
www.cedefop.eu.int
www.trainingvillage.gr

Johan van Rens

European Centre for the Development
of Vocational Training (Cedefop)
E-mail: jvr@cedefop.eu.int
www.cedefop.eu.int
www.trainingvillage.gr

Acronyms and country codes

Country codes

A	Austria
AL	Albania
B	Belgium
BG	Bulgaria
BiH	Bosnia and Herzegovina
CCs	Candidate countries
CEECs	Central and eastern European countries
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
D	Germany
DDR	see 'GDR'
DK	Denmark
E	Spain
EE	Estonia
EL	Greece
EU	European Union
F	France
FIN	Finland
GDR	Former German Democratic Republic

HU	Hungary
I	Italy
IRL	Ireland
IS	Iceland
L	Luxembourg
LV	Latvia
LT	Lithuania
N	Norway
NL	Netherlands
P	Portugal
PL	Poland
RO	Romania
S	Sweden
SK	Slovakia
SL	Slovenia
UK	United Kingdom
US	United States
USA	United States of America
UZB	Uzbekistan

Institutions and organisations (in brackets: country)

* unofficial translation

BA	Bundesanstalt für Arbeit (since 2004: Bundesagentur für Arbeit) / Federal Employment Services (D)
bfw	Berufsbildungswerk Hamburg / The German Trade Union Confederation's Further Vocational Training Centre in Hamburg* (D)
bfb	Berufliche Fortbildungszentren der Bayerischen Wirtschaft / Vocational Continuing Training Centres of the Bavarian Business Sector (D)
BIAT	Berufsbildungsinstitut Arbeit und Technik der Universität Flensburg / Institute for Technical Vocational Education at the University of Flensburg (D)
BIBB	Bundesinstitut für Berufsbildung / Federal Institute for Vocational Training (D)
BITKOM	The German Information, Telecommunications and New Media Association (D)
BMBF	Bundesministerium für Bildung und Forschung / Federal Ministry of Education and Research (D)
Cedefop	European Centre for the Development of Vocational Training
CEP	Centre for Economic Performance (UK)
Céreq	Centre d'études et de Recherches sur les Qualifications / Centre for Research on Education, Training and Employment (F)
DfEE	Department for Education and Employment (UK)
DG	Directorate-General (of the European Commission)
DGB	Deutscher Gewerkschaftsbund / German Trade Union Confederation* (D)
DG EAC	Directorate-General Education and Culture (of the European Commission)
DRV	Deutscher Reisebüro und Reiseveranstalter Verband / German Travel Agents' and Tour Operators' Association* (D)

DURSI	Ministry of Universities, Research and Information Society (E)
EC	European Commission
EEO	European Employment Observatory
EICTA	European Information and Communications Technology Industry Association
EIESP	European Institute of Education and Social Policy (F)
ESTO	European Science and Technology Observatory
ETF	European Training Foundation
ETUC	European Trade Union Confederation
EUROSTAT	Statistical Office of the European Communities
FBH	Forschungsinstitut für Berufsbildung im Handwerk an der Universität zu Köln / Research Institute for Vocational Education and Training in the Crafts Sector at the University of Cologne (D)
Fraunhofer IAO	Fraunhofer-Institut für Arbeitswirtschaft und Organisation / Fraunhofer Institute for Industrial Engineering (D)
FORCEM	Fundación para la Formación Continua / Foundation for Continuing Training* (E)
GRET	Grup de Recerca sobre Educació i Treball / Education and Work Research Group* (E)
HK-Forschung	Helmut Kuwan, Sozialwissenschaftliche Forschung und Beratung München / Helmut Kuwan, Social Research and Consultancy, Munich* (D)
IAB	Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit / Institute for Employment Research of the German Federal Employment Services (D)
ICE-UAB	Instituto de Ciències de l'Educació – Universitat Autònoma de Barcelona / Institute of Education Sciences – Autonomous University of Barcelona (E)
IDESCAT	Statistical Institute of Catalonia (E)
IEEP	UNESCO's International Environmental Education Programme
ILO	International Labour Office

INEM	Instituto Nacional de Empleo / National Employment Institute (E)
Infratest	Infratest Sozialforschung / Infratest Social Research (D)
IPK International	World Travel Monitor Company
IPTS	Institute for Prospective Technological Studies
ISFOL	Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori / Institute for the Development of Workers' Vocational Training* (I)
ISMEA	Institut des Sciences Mathématiques et Economiques Appliquées / Institute of Mathematical Sciences and Applied Economics (FR)
ISTAT	Istituto Nazionale di Statistica / National Institute of Statistics (I)
isw	Institut für Strukturpolitik und Wirtschaftsförderung / Institute of Structural Policies and Economic Development (D)
KWB	Kuratorium der Deutschen Wirtschaft für Berufsbildung / German Employers' Organisation for Vocational Training (D)
NCVQ	National Council for Vocational Qualifications (UK)
NOET	National Observatory of Employment and Training (CZ)
NSTF	National Skills Task Force (UK)
NTF	National Training Fund (CZ)
OAED	Greek Manpower Employment Organisation (GR)
OECD	Organisation for Economic Cooperation and Development
PES	Public Employment Services (CZ)
QCA	The Qualifications and Curriculum Authority (UK)
RILSA	Research Institute of Labour and Social Affairs (CZ)
ROA	Researchcentrum voor Onderwijs en Arbeidsmarkt / Research Centre for Education and the Labour Market (NL)
SCOTVEC	Scottish Vocational Education Council (Scotland)
SEU	Social Exclusion Unit (UK)
SSCs	Sector Skills Councils (UK)
SSDA	Sector Skills Development Agency (UK)

ÚIV	Institute for Information in Education (CZ)
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNEVOC	UNESCO's International Centre for Technical and Vocational Education and Training
UNICE	Union of Industrial and Employers' Confederations of Europe
WTO	World Trade Organisation
WTO	World Tourism Organisation
WZB	Wissenschaftszentrum Berlin für Sozialforschung / Social Science Research Center Berlin (D)

Terms and other acronyms

Ateco'91	Attività Economica '91 / 1991 Economic Activity Code* (I)
BAT	British American Tobacco (D)
Cedra	Cedefop Research Arena
CIRCA	Communication and Information Resource Centre Administration
CLFS	Community Labour Force Surveys
CMC	Computer-mediated communication
CompTIA	Computing Technology Industry Association
CPI	Consumer price index
EAGGF	European Agricultural Guidance and Guarantee Fund
ECDL	European Computer Driving Licence
ECONLIT	Electronic Bibliography of Economics Literature
EDP	Electronic data processing
ECTS	European Credit Transfer System
EPA	Active Population Survey (E)
EPOC	Employer perception of courses

ERDF	European Regional Development Fund
ERO	European Research Overview (Cedefop)
ERNIE	Electronic Recruiting News in E-mail
ESF	European Social Fund
ETV	European Training Village (Cedefop)
EUCIP	European Certification of Informatics Professionals
FIFG	Financial Instrument for Fisheries Guidance
FISTERA	Foresight on Information Society Technologies in the European Research Area (network)
FreQueNz	Network for early identification of qualification needs (D)
F.U.R	Forschungsgemeinschaft Urlaub und Reisen / Research Association Holiday and Travel* (D)
GDP	Gross Domestic Product
HR	Human resources
HRD	Human resource development
IALS	International Adult Literacy Survey
ICT	Information and communication technology
IDQ®	Instrumentarium zur Dauerbeobachtung der Qualifikationsentwicklung® / Method for the regular monitoring and early identification of qualification trends (D)
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
IT	Information technology
KMS	Knowledge management system (Cedefop)
LFS	Labour Force Survey
MEDA	Euro-Mediterranean Partnership
NOS	National Occupational Standards (UK)
NPPT	National Programme for Personnel Training (UZB)
NQF	National Qualifications Framework (UK)

NUTS	Nomenclature of Statistical Territorial Units
NVQ	National Vocational Qualifications (UK)
PC	Personal computer
PISA	Programme for International Student Assessment (OECD)
PTU	Vocational schools (UZB)
POMF	Post Mortem of Manpower Forecasting (GR)
ReferNet	Network of Reference and Expertise (Cedefop)
R&D	Research and development
Skillsnet	Network for Early identification of skill needs (Cedefop)
SME	Small and medium sized enterprise
SPOC	Student perception of courses
SSE	Senior Secondary Education (UZB)
TA	Technical assistance
TAER	Technical assistance to education reform
TOR	Terms of reference
VET	Vocational education and training

Cedefop (European Centre for the Development of Vocational Training)

Identifying skill needs for the future

From research to policy and practice

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Identifying skill needs for the future

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In a rapidly changing environment early identification of skill needs is becoming increasingly challenging. The pace of technological change and innovation entails demands for new skills and competences on the labour market. Availability of reliable and accurate information on skill trends is a precondition for a timely response to new and changing training and education needs. This publication highlights some challenges and solutions for early identification of skill needs and analyses results, their relevance and transfer to policy and practice. It gives some examples of good practice in identifying, anticipating and monitoring changing and emerging skill needs at national, sectoral and regional levels, and for specific target groups.

The publication is based on proceedings of the international conference organised during the Greek Presidency in May 2003 in Thessaloniki. It continues the debate begun in the first publication 'Early identification of skill needs in Europe', Cedefop, BMBF, 2003. Information can be found on the website of the newly created network Skillsnet: http://www.trainingvillage.gr/etv/Projects_Networks/Skillsnet.

**Susanne Liane Schmidt, Olga Strietska-Iliina
Manfred Tessaring, Bernd Dworschak**



European Centre for the
Development of Vocational Training

Europe 123, GR-570 01 Thessaloniki (Pylea)
Postal address: PO Box 22427, GR-551 02 Thessaloniki
Tel. (30) 23 10 49 01 11, Fax (30) 23 10 49 00 20
E-mail: info@cedefop.eu.int
Homepage: www.cedefop.eu.int
Interactive website: www.trainingvillage.gr

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