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Systems, institutional frameworks and processes for early identification of skill needs

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Systems, institutional frameworks and processes for early identification of skill needs

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(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.
Cedefop was established in 1975 by Council Regulation (EEC) No 337/75.

Foreword

FÁS (Training and Employment Authority of Ireland) and the Irish Government's expert group on future skill needs welcomed the opportunity to coorganise with the European Centre for the Development of Vocational Training (Cedefop) the international conference on systems, institutional frameworks and processes for early identification of skill needs.

The vision introduced by the Lisbon European Council is a European economy in which knowledge would be the key factor of production. By developing a knowledge-based economy, Europe can enjoy a high standard of living while retaining a strong competitive industrial base.

The European education and training system has a critical role to play in realising this strategy. It must provide opportunities for both graduates and workers to acquire the skills to work in the knowledge economy. Information on what these skills are, their magnitude, and how they should be delivered are key components of this strategy.

The conference presented an opportunity for those involved in gathering that type of information to learn how their colleagues in other EU Member States – and in some non-EU countries – identify the key skill needs of their economies. Several Member States, including Austria, France, Germany, Ireland, the Netherlands and the United Kingdom, presented their systems, approaches and key players in the process of identifying skill needs. In addition representatives of several new Member States and acceding countries in central and eastern Europe such as the Czech Republic, Estonia and Romania gave presentations on the systems in place or emerging in their countries. The presentation outlining the system in the US was a useful comparison for European colleagues.

The conference also included several workshops on specific methodologies associated with skill needs identification including regional and sectoral approaches. There were also several presentations of good practice examples on how the results of research in this area are translated into policy and practice.

Finally, the conference heard how EU institutions and international organisations, such as OECD are analysing skill needs, what systems are in place and which projects and activities are envisaged for the future. The audience discussed the need and possible solutions for early identification of skill needs at European level.

Approximately 100 delegates representing 22 countries attended the conference. FÁS and the expert group on future skills needs were delighted to host such a successful conference and we look forward to attending other 'follow-up' conferences on this important issue central to the future success of the European economy.

Anne-Heraty   Rody Molloy
Chairperson   Director General
Expert group on future skill needs   FÁS

Preface

Early identification of skill needs involves very different approaches in research and analysis performed by several institutions at various levels. The conference in Dublin discussed strengths and weaknesses of diverse systemic, institutional, political and other contextual arrangements of early identification of skill needs across countries.

The conference was organised in November 2004 jointly by the Irish expert group on future skill needs, the Irish Training and Employment Authority (FÁS), and the European Centre for the Development of Vocational Training (Cedefop), particularly its international network on early identification of skill needs, Skillsnet. The conference was attended by over 100 participants from the EU, acceding countries and the US. The present volume results from proceedings of the conference presentations and discussions.

Parts I and II review systems of early identification of skill needs in Ireland, the US, the UK, the Netherlands, France and Germany. Almost all countries have developed systems where regular occupational forecasting plays an important role. The forecasts, however, differ in nature, varying from a high level of detail to more general forecasts, from static to dynamic approaches, serving different purposes (career guidance or policy-making), limited to the demand side or including supply forecasts.

It is important, however, that systems comprise additional data and analyses, such as vacancy statistics, enterprise surveys, scenarios and observatories, studies of skill needs in sectors and regions. Systems strive to incorporate these other methods and approaches so that they work hand in hand with quantitative forecasts and add the value of more precise or more qualitative-like knowledge on changing occupational profiles, newly emerging occupations, interoccupational mobility and quality of skills required on the labour market. This demands active interinstitutional cooperation and often a holistic approach in research into identifying skill needs. Germany, in particular, found a solution by creating a network on early identification of qualification requirements which includes research institutions, social partners, businesses, educational establishments and other bodies.

Part III focuses on systems of early identification of skill needs in transition countries. These countries were represented by the Czech Republic, Estonia and Romania. Their systems are still very much in the development stage. Some countries started forecasting activities several years ago, as for instance, the Czech Republic which developed a system relying on the Dutch method and combined with qualitative data. Estonia employs the Irish approach and concentrates on selected sectoral studies. Romania develops demand-side forecasting based on a survey. In these countries too, macroeconomic forecasts are used complemented by qualitative surveys and analyses.

Part IV is based on presentations and discussions during the workshop on how different levels of identification of skill needs – national, regional, sectoral, company – can complement one another and contribute to national systems. Contributions not only give specific examples of good practice in identification of skill needs in concrete sectors and occupations but also focus on some more systemic approaches to sectoral and regional analysis. A summary and conclusions of results are provided at the end of Part IV.

Part V is also based on presentations and discussions during the workshop, which focused on transfer of research results in early identification of skill needs into policy and practice. Workshop participants attempted to grasp how the transfer can be ensured, how it can be embedded in the system, and whether research is linked to counselling and guidance. The workshop drew on experiences of projects and initiatives carried out in Germany, France and Austria. A summary and conclusions of results are provided at the end of Part V.

Part VI looks at some initiatives and information sources in early identification of skill needs at European level. In particular, it reviews the project which compared skill needs forecasting in selected OECD countries. Another contribution – from OECD – presents questions and methods of a newly planned international survey to assess adult competences. The last chapter verifies the information bases of Cedefop and the European Training Foundation (ETF) on systems of early identification of skill needs in EU Member States and acceding countries.

The conference revealed many similarities in modern systems of and approaches to early identification of skill needs. Some conclusions were drawn for an eventual European system for early identification of skill needs. Although several national efforts are similar in nature, the results are not comparable. Surveys, analyses and data collection at European level are limited to certain standardised data (e.g. Eurostat – labour force survey, job vacancy survey; activities of the Directorate General Employment, Social Affairs and Equal Opportunities of the European Commission – the public employment services' vacancy monitor). More in-depth analyses at European level are available only for selected countries and/or sectors.

Conference participants asked for more activities in early identification of skill needs at European level. Such activities, at the beginning modest in nature with a possible expansion in future, should produce comparable results across Member States on the future skills required on the labour market in Europe. Cedefop was asked to take the lead through its network on early identification of skill needs, Skillsnet. First, it was suggested to organise an expert workshop to verify feasibility of establishing a European system of skill needs forecasting. The Human Resource Development Authority of Cyprus – a member of Skillsnet – kindly offered to host the workshop in 2005.

We hope that the conference, which resulted in the present publication, was not only a successful event but gave impetus for further activities on the path to developing a European system of early identification of skill needs.

Manfred Tessaring   Olga Strietska-Ilina

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The system for the early identification of skill needs in Ireland

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> *This contribution contains a summary of the key players, systems and processes involved in the early identification of skill needs in Ireland. It focuses in particular on the creation of a national skills database and its function in providing comprehensive data on issues relating to the demand and supply of skills in a comprehensive and timely manner. The authors provide some practical examples of how the information stored in the database has been used in the formulation of policy by government departments and agencies.*

1. Key players in the process of early identification of skill needs in Ireland

There are several key players in the Irish system of early identification of skill needs. These include the expert group on future skills needs, the National Training and Employment Authority of Ireland (FÁS) and, in particular, its skills and labour market unit, and the Economic and Social Research Institute (ESRI). Their functions are summarised briefly below.

The expert group on future skills needs was set up by government in 1997 – initially in response to what was perceived at the time to be a chronic shortage of computer professionals. However, its remit has expanded and it now monitors all sectors of the Irish economy – albeit with an emphasis on the enterprise sector – to identify any current or future skill shortages and making recommendations to government on how they can be resolved.

The expert group is a tripartite committee – it contains representatives of the social partners and government. It meets every quarter and it reports to the Minister for Enterprise, Trade and Employment. It has a 'joint secretariat' which meets monthly basically to identify if reports are complete and ready to be presented to the expert group.

Since its inception, the expert group have commissioned external researchers to monitor the skills profile of different sectors of the economy. However, in 2001 the expert group decided to create its own research arm – the skills and labour market research unit (SLMRU) – to provide it with ongoing analysis of skill needs in different sectors. The expert group continue to commission research from external research agencies for substantive pieces of work – the rationale for setting up the SLMRU was to have an in-house facility capable of providing a skills monitoring role tracking trends in skills demand and supply across the economy rather than any in-depth investigation into a particular sector. These reports are called 'skills monitoring reports' and their purpose is to provide a detailed profile of the skills demand and supply in a particular 'family of skills'. The SLMRU, however, does include forecasts of skills demand and supply in its reports to the expert group.

The SLMRU is part of FÁS. It was chosen as the location of the SLMRU because it already had a strong reputation in skills research and it was already collecting data on the labour market such as data on vacancies, jobseekers and apprentices.

ESRI is also a key player in the system of skills research. It is the major 'private' research organisation in Ireland and it is involved in a wide range of research on both economic and social issues. On skills research, however, the critical role played by ESRI is that it provides medium-term forecasts of growth in the economy using a macroeconomic model, including forecasts of growth in each main economic sector. These forecasts are well regarded and government regularly uses them to formulate and justify policy interventions in many areas.

Since the early 1990s, ESRI have engaged in a joint venture with FÁS based on which ESRI 'translate' their output forecasts into forecasts of employment by 43 occupational subgroups. Thus, ESRI play a critical role in the Irish system of skills identification by providing the 'bridge' between the forecast output from each sector of the economy and the skills needed to produce that level of output.

Thus both ESRI and the SLMRU provide forecasts of skills demand. However, the forecasts provided by the SLMRU differ from those provided by ESRI in that they are forecasts of individual occupations rather than of occupational groups. Of course, this means the potential for significant error is much greater in the SLMRU forecast. However, the expert group is interested in the demand and supply of skills as such. For example, they wish to know if the supply of graduate architects or civil engineers is sufficient to meet the requirements of the construction industry over the next decade and this type of question can only be answered by attempting to forecast at individual occupation level. The SLMRU attempts to reduce the margin of error by conducting regular reviews of their forecasts and by ensuring that, in cases where the forecast identifies shortages, the conclusion is consistent with a range of labour-market indicators such as immigration, vacancies, earnings trends and so on.

The data which the SLMRU uses to produce its skill monitoring reports comes from the national skills database, developed by the SLMRU at the request of the expert group.

2. National skills database

2.1. Introduction

The national skills database was developed to collate all available data on the supply and demand of skills on the Irish labour market. This includes data on employment, education, immigration, notified vacancies, job-seeker activity, etc. The database is considered a principal tool for analysing and forecasting the labour market at occupational level. representing the most comprehensive source of quantitative information essential for the early identification of skill needs. The technical specifications, coding practice, and the database content are presented below with an example of their use.

2.2. Technical specifications

The national skills database was designed as a Microsoft Sequel Server 2000 database. Microsoft Access project files are used to access data from the server. The front end of the database is not formally designed. While a whole range of software packages can be used to query and analyse the data (such as SPSS, Excel, etc.), the one currently used is Microsoft Access. However, several features are added to the basic Microsoft Access package to maximise efficiency when using the database. These include, *inter alia*, several predesigned user friendly queries. Their purpose is to ease quick analysis of recurring tasks. Use of the database is confined to a few high-end users. The number of users is restricted because of data confidentiality issues, but also because to interpret the data held in the database, knowledge of how the data is collected, stored and related is essential.

Figure 1 shows the architectural solution for the national skills database. The structure comprises three tiers: server, system and user levels. Data are received from various sources through network folders at system level. Once received, data are validated and loaded into the database through the data validation and loading interface at user level. The data, as well as several structured query language stored procedures and views, are stored on the server. Direct interference with the data is possible via the administration interface associated with the highest level of access, normally assigned to the database administrator. Data are retrieved from the database through a data extraction interface at user level. To preserve the raw data in the database, each user creates an extract which is saved in individual users' folders on the server. These extracts can be analysed though various data manipulation techniques using the data analysis interface at user level.

Figure 1: Architecture of the national skills database
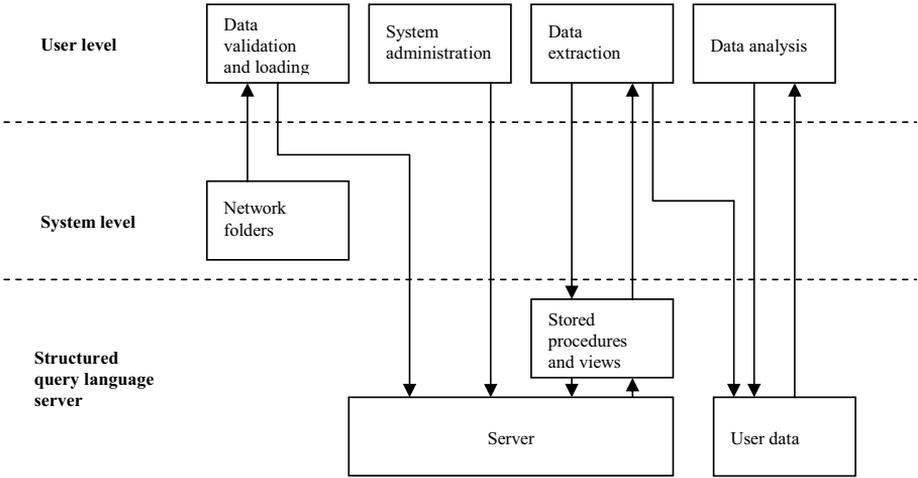
To preserve the confidentiality of data, as well as to protect data held in the database from accidental deletion or incompetent use, access is password protected. Moreover, there are three levels of access to the database, with highest level assigned to the database administrator and the most basic level of access secured for manual data entry. Most users are assigned the second level of access which allows viewing, querying and extraction of data.

2.3. Data classification

The principal objective of the national skills database is to provide all available information on supply and demand of skills at national level. However, none of the sources that provide labour-market statistics for the database gather data at skill level. The data gathered are at different levels of aggregation. To unify all information received from various data sources, all data in the national skills database are coded using internationally recognised classifications. Most data are coded using the standard occupational classification (SOC) ([1]), whereby skills are approximated by occupations. However, supply of skills, in terms of provision by the education system at various levels, is classified using the international standard classification of education (ISCED), whereby skills are approximated by fields of education.

SOC provides codes for occupations at four levels of aggregation. At one-digit level, classification includes nine broad occupational groups (e.g. professional, associate professional, etc.). At two-digit level it includes 77 occupational subgroups (e.g. natural scientists, engineers and technologists, etc.). Each subgroup contains several occupations (e.g. biological scientists, civil engineers, etc.), which can be further subcategorised into job titles (e.g. biologist, botanist, etc.). As already mentioned, the database is organised around the notion that a skill can be approximated by occupation. Ideally, job title would be the most appropriate approximation. However, due to the limitations of data, at best a three-digit coding can be applied. Therefore, almost all data stored in the database is coded at a third level of aggregation (three-digit level), with an occupation as a primary key, unless sufficiently detailed information is available to allow for four-digit coding. Naturally, if required, all information is easily provided at higher levels of aggregation.

Similarly, ISCED provides codes for fields of education at three levels of aggregation. At one-digit level it provides codes for broad educational fields (e.g. arts, social studies, etc.). These codes are further subdivided into two-digit and three-digit ones. In the national skills database, data on education are classified using three-digit ISCED codes. Use of separate coding for education data arose because occupational classification, in most instances, does not provide an adequate coding platform for education data. For example, a business course can be associated with providing a skill for several occupations in administration, management, finance, etc. Hence, several SOC codes can be assigned to a business course, while a unique ISCED code corresponds to this field of education. As a result of this dichotomy in the coding of data stored in the database, demand and supply data are most commonly analysed separately, unless an education field can be assigned a unique SOC code.

While the Central Statistics Office of Ireland provides its data already coded by SOC, all other data received are coded prior to entry into the database. This is done either by applying a previously designed mapping procedure onto the incoming data, or by manual coding of individual records during each entry.

([1])   The database uses SOC 1990 to ensure compatibility with Central Statistics Office coding practice.

2.4. Database content

Data stored in the national skills database are collected from numerous sources, at various frequencies and in different formats. All data are classified as either demand or supply of skills and coded by occupational or educational classifications as appropriate. Demand data refers to employment, vacancies and immigration data. Supply data includes education provision at various levels by field and job-seeker data. These are discussed in turn below.

2.4.1. *Demand for skills*

In Ireland, the following information is currently available for assessing the demand for skills.

(a) Employment stock

Employment data is provided by the quarterly national household survey conducted by the Central Statistics Office. The survey is based on a sample covering in excess of 100 000 individuals and represents the most important source of labour-market data in Ireland. Each record in the sample can be grossed up and used in drawing inference about the entire population. The survey covers areas regarding personal attributes (e.g. age, gender, etc.), employment status, current employment (e.g. occupation, type of tenure, hours worked, etc.), education (highest education level attained, current training, etc.), job search efforts, etc. The survey commenced in its existing format in 1997.

(b) Notified vacancies

Notified vacancies represent an important source of information on demand for skills. The national skills database currently collects the following data on vacancies.

(i) FÁS notified vacancy data

As one of many initiatives associated with the government's active labour-market policy, FÁS provides an advertising service for companies seeking to recruit. In particular, those wishing to employ a non-national are obliged to advertise with FÁS for a specific period of time, to ensure that no Irish or EU candidates are available for the position. Traditionally, mostly craft-related jobs were advertised with FÁS. More recently, vacancies for higher skills have increasingly been registered. Each notified vacancy is recorded, with details of the tasks and conditions associated with the job, but most importantly an occupational code is assigned to it.

(ii) ESRI/FÁS hard to fill vacancy survey

ESRI in Ireland conducts a monthly survey of four sectors of the economy to assess current and expected future prospects of employment. Sectors covered by the survey include: the construction industry, manufacturing, retail and other services. One area covered by the survey is difficult-to-fill vacancies. Employers are asked to rank six difficult-to-fill positions in the relevant month. This is an important and timely indicator of excess demand for skills. Each difficult-to-fill vacancy reported by the survey is incorporated into the national skills database and prior to entry an appropriate four-digit SOC code is assigned to it.

(iii) The *Irish Times* advertisements

The national skills database also includes data on vacancies advertised weekly in the *Irish Times*. These usually consist of high-skill professional and associated professional jobs. Prior to entry into the database, each vacancy is assigned a three-digit SOC code.

(c) Immigration inflow

Since the mid-1990s, Ireland has experienced large inflow of labour from abroad. Strong economic performance resulted in a shortage of skills in several sectors of the economy and made Ireland an attractive destination for economic migrants. To control inflow of non-EU nationals onto the domestic labour market, the government introduced work visa/authorisation and work permit schemes. Data on these flows are recorded and provided monthly by the Department of Enterprise, Trade and Employment.

(i) The work visa and authorisation scheme

To alleviate acute shortages of skills in affected sectors of the economy, the government has introduced a two-year work visa scheme for the following occupations: architects, IT specialists, civil engineers, surveyors, nurses, doctors, therapists, dentists, radiologists, biological scientists, physicists, psychologists and social workers. Nationals of countries that do not need a visa to travel to Ireland are required to obtain work authorisation prior to employment.

(ii) The work permit scheme

This is designed for non-EU nationals wishing to work in Ireland not covered in the list of occupations provided by the work visa scheme. A work permit is issued at the request of an employer, who must prove, by advertising in FÁS, that no Irish or EU candidates are available to fill the position. The national skills database receives monthly feeds from both schemes. All data are SOC coded prior to the entry. A mapping procedure which relates FÁS notified vacancies and work permit data is put in place to ease automatic occupational coding of work permit data.

2.4.2. *Supply of skills*

The output of education courses is used to approximate the supply of skills in the national skills database. The Irish education system offers numerous choices to those who want to continue their education after secondary level and acquire skills. These choices include post leaving certificate (PLC) courses, vocational training courses (FÁS courses) and third level certificate, diploma and degree courses in institutes of technology and universities. For supply of skills, the following is collected and stored in the national skills database:

(a) PLC enrolment data

In Ireland, on successful completion of secondary school, students are issued a leaving certificate. There are several one- or two-year PLC vocational courses available to those interested in further development of skills. These courses cover various fields such as business, art, computers, etc. The national skills database receives annual information on the uptake of these courses from the Department of Education. Given that each course is coded by a three-digit ISCED code, enrolment data can be used systematically as an indicator of the supply of skills at PLC level.

(b) FÁS enrolment and certification data

FÁS is an important provider of non-academic education programmes. These include numerous courses, traineeships and apprenticeships.

(i) Courses

Among other initiatives, FÁS provides many short vocational courses. Enrolment and certification data from FÁS courses are regularly fed into the national skills

database. All FÁS courses are three-digit ISCED coded (and where possible a three-digit SOC is also assigned), so that activity data can be used as an indicator of supply of skills.

(ii) Apprenticeships

FÁS provides 27 four-year apprenticeship programmes, mainly in construction and manufacturing. Participation and completion data is fed into the national skills database monthly. Each trade is both ISCED and SOC coded at three-digit level.

(c) Central Applications Office data

The entry procedure for almost all third level institutions in Ireland is administered by the Central Applications Office. The institutions covered include all national and some private colleges. While the records held are at individual level, they can be aggregated to course level. As such, the Central Applications Office represents an important source of data for students' preferences, as well as potential supply of labour at skill level. The national skills database is currently acquiring these data.

(d) Institutes of technology enrolment and graduation data

Once considered providers of third level vocational education, more recently institutes of technology have been moving towards more academic education provision, currently offering courses at higher certificate, ordinary degree, honours degree and postgraduate levels. Enrolment data are provided by the Department of Education and Science for the national skills database. Graduation data are provided by the institutes awarding body – the Higher Education and Training Awards Council and by some individual institutes with delegated authority. All courses on offer are three-digit ISCED coded, allowing for assessment of supply of skills at this level of education.

(e) University enrolment and graduation data

Student enrolment and graduation data at undergraduate and postgraduate level for all universities in Ireland are collected by the Higher Education Authority – a government agency associated with the Department of Education. Annual data on enrolments and graduation at course level are regularly fed into the national skills database. In the database, all courses on offer are three-digit ISCED coded which allows for the information received to be used as an indicator of potential and actual supply of labour at skill level.

(f) First destination survey

The Higher Education Authority also provides information on the destination of students who graduate from almost all third level institutions. An annual survey of all graduates is conducted to collect information on whether they have entered the labour force or continued education, whether they are in the country or abroad, whether they are employed or not and whether they work in the area related to their qualification. As such, the survey represents a key source of information necessary to estimate the actual supply of labour. Results of the survey are fed into the national skills database annually. While there are currently issues with the different coding practices between the Higher Education Authority and the national skills database, all efforts have been made to ensure the most appropriate mapping of the two, so that results from the first destination survey can be used in skills analysis.

(g) Job-seeker data

One key responsibility of FÁS is to assist the unemployed in search of employment. This

is done by registering unemployed persons who opt to use FÁS services and keeping their qualifications on record, while trying to find an adequate match from the jobs on offer. Given that each individual on record is assigned at least one occupational code to describe their qualifications, these data can be used as an indicator of excess supply of labour at skill level. Thesedata are fed monthly into the national skills database.

2.4.3. Other

The national skills database also contains several data sets on general labour-market indicators (such as replacement rates for different occupational groups, labour-force data, etc.), as well as all important macroeconomic indicators (e.g. output growth rate, inflation, etc.). The database is also used for storing any other data relevant for research in this area collected on an ad hoc basis. This includes various sector specific data, demographic data and any other information considered useful for analysing the labour market.

2.5.   Use of the database

The database is designed to provide timely analysis of the key indicators on the supply and demand of labour for almost 400 occupations. The list bellow is used to illustrate the type of information that can be obtained from the database for an occupation of interest (e.g. architects, nurses, plumbers, etc.).

Examples of indictors provided by the national skills database for any of the selected occupations include:
- employment stock over time;
- composition of employment by gender;
- composition of employment by age;
- composition of employment by education;
- composition of employment by nationality;
- breakdown of employment by sector;
- number of notified vacancies over a specified period of time;
- difficulty in filling vacancies;
- inflow of immigrant workers;
- education provision;
- potential supply from a selection of educational providers;
- first destination of qualified in the field of interest;
- attrition of labour;
- replacement rate.

Given all the data collected and stored in the national skills database as described above, the database has become an indispensable tool for assessing the labour market at occupational level. In future, its use is expected to assist policy formation in several areas, such as employment, immigration and education, and also to serve the wider public by providing information relevant for career guidance.

Occupations and skills in the US: projection methods and results

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> The contribution summarises the US system for projecting occupational and skill needs. It explains the methodology of employment projections, the policy and institutional frameworks and projections timetables. It describes further the occupational information network O*NET, its methods and products. The final section of the paper discusses the policy process for the US occupational projections system, the major actors in the system, how they interact, and how the system functions in terms of financing, feedback, and policy decisions.

1.   Introduction ([2])

Like many other nations, the US has strong needs for information on what the labour market will look like in the future. Potential consumers of such information include employers, who must decide where to locate their firms and what production technology to use, and government institutions responsible for the education and training of the labour force, to make sure that the education and training provided corresponds to the economy's needs. This paper summarises the US system for projecting occupational needs and skill levels.

The second section of the paper presents the projections methodology and employment projections. The methodology is described in some detail, including the parties involved in making the projections and the timetables used. This section also describes the policy framework under which the projections staff operates and the methods used to provide the projection results to users. It further describes US efforts to include skills in the projections system. The Bureau of Labor Statistics (BLS) tries to project educational upgrading for higher education occupations, and although these efforts are included in the projections, few details are released.

The most notable US effort dealing with job skills is development of O*NET, the occupational information network, which provides a wealth of characteristics, including various categories of occupational skill data. The methodology and products of O*NET are described in the third section of the paper. The final section of the paper discusses the policy process for the US occupational projections system. This section describes the major actors in the system, how they interact, and how the system functions in terms of financing, feedback, and policy decisions.

([2])   This paper is an updated and condensed version of Barnow (2002).

2. Employment projections

2.1. Projections methodology (^{3})

The BLS has been making intermediate and long-term projections of key labour-market variables and trends for over 35 years. The original impetus for the projections programme came after World War II, when Congress (the federal legislative branch) was concerned about job opportunities for returning veterans. The projections programme became an ongoing BLS activity, and the projections are now widely used for purposes such as career counselling and planning, setting priorities for government and privately sponsored education and training programmes, and as a factor in economic policy formation.

Beginning in the early 1970s, employment projections were produced on a two-year cycle. In recent years, the projections have covered a 10-year period. Prior to the last two rounds, BLS produced projections under three different scenarios, but because most users employed the moderate scenario and the alternative projections were sometimes misused, BLS currently only produces one set of projections.

The employment projections programme provides more than occupational projections. They also include projections of the size and composition of the labour force, the size and distribution of gross domestic product (GDP) and economic growth, and output and employment by industry. BLS performs only limited analyses dealing with skill levels and projecting changes in occupational skill levels. Occupations are characterised into one of 11 skill/training categories, and BLS publishes the projections with skill and training requirements for each occupation (Andreassan et al., 2004). In analyses dealing with skill levels and preparation, BLS includes measures of 'educational upgrading', which is described as follows: when organisations restructure or change, they rely on workers in certain occupations to assume new responsibilities. As a result of a reduction in the number of middle managers, for example, firms have shifted some managerial responsibilities to other workers [...]. As educational requirements are upgraded, subsequent job openings are considered to be new openings in college-level jobs (Mittelhauser, 1998).

BLS does not publish its projections on educational upgrading, but instead subsumes them under its projections of new jobs created. The projections process consists of six steps or components (US Department of Labor, 1997):

- the size and demographic composition of the labour force;
- the growth of the aggregate economy;
- final demand or GDP by consuming sector and product;
- interindustry relationships (input/output tables);
- industry output and employment;
- occupational employment.

(^{3})   This section is based primarily on US Department of Labor (1997) and discussions with Neal Rosenthal.

2.2. Labour force

Labour force projections ([4]) begin with projections of the population produced by the Bureau of the Census in the Department of Commerce. Because the projections are for periods of 10 years or less, the relevant population has already been born. The population projections include adjustments for net migration ([5]). Labour-force projections are made for 130 age-gender-race/Hispanic origin groups. Labour-force participation rate projections begin with projections of trend rates over the previous eight years. Trend rates are modified when time series projections are inconsistent with cohort and cross section analyses. The labour-force figures are calculated by multiplying the participation rate by the relevant population figure.

2.3. Aggregate economic growth

BLS does not make its own projections of economic growth in GDP, but instead relies on projections of a private-sector commercially available model. Until the latest round of projections, BLS used a macroeconomic model developed by Data Resources, Inc. as the basis for its macroeconomic projections; BLS currently uses the model developed by Macroeconomic Advisors (Su, 2004). Rather than rely on the macro models specifications of the exogenous variables, BLS makes its own assumptions on these variables and relies on the model's specification of how the variables interact to influence the economy.

2.4. Composition of final demand

The next step in the projections process is the allocation of GDP among approximately 180 sectors in the economy. First, GDP is disaggregated into four broad categories: personal consumption expenditures, business investment, foreign trade (exports minus imports), and government purchases. Within each of the four broad categories, estimates of final demand are made by commodity sector. The BLS analysts make use of bridge tables that relate final demand by product type to final demand by commodity sector. Although analysts have significant flexibility in making sectoral estimates, they are constrained by the sectoral estimates produced by the macroeconomic model.

2.5. Interindustry relationships (input/output)

Not all goods and services are involved in final demand. The next stage of the projections process involves estimating intermediate flows of goods and services. To perform these analyses, BLS uses an input/output model that relates the final demand by commodity sector to industry output by sector. The input/output model is based on 'use' and 'make' tables. The use table shows the purchase of commodities by each industry as inputs into its production process. The make table shows the industrial distribution of production for each industry. The use table is developed to include assumptions on how the use of various inputs is expected to

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([4])   The most recent labour-force projections are presented in Toossi (2004).

([5])   No distinction is made in either the population projections or the labour-force projections between legal and illegal immigrants.

change over the projection period. The end product of this step of the projection process is a complete listing of industry output by sector ([6]).

2.6.   Industry employment ([7])

BLS then projects the number of jobs and hours for both employees and self-employed workers by industry. For wage and salary workers, BLS uses a constant elasticity of substitution production function to estimate employment for each industry ([8]). Projections of average hours are used to determine the number of jobs in the industry. The number of self-employed and unpaid family workers is estimated based on a time trend and the unemployment rate. Projected industry employment and output permits the calculation of productivity rates. If the initial projections of industry employment lead to unacceptable implications for productivity, industry employment estimates are modified.

2.7.   Occupational employment ([9])

Once employment by industry is known, BLS calculates occupational employment by using an industry-occupation matrix that includes over 250 industries and 500 occupations. Data for the matrix are gathered by State employment security agencies for use by BLS. The occupational projections are not based on a mechanical application of the matrix, however. First, BLS staff look for trends in staffing patterns and, if appropriate, factor such trends into the projections. Second, other factors not reflected in past trends are used to modify the matrix. Finally, projected employment for a given occupation is calculated by summing across all industries.

2.8.   Final review

After initial projections are developed, the analysis and results of each stage are reviewed for consistency and reasonableness. Results are reviewed by BLS staff in the projections groups and in other BLS components to assure that the final products are consistent and reasonable.

The BLS occupational projections programme is linked to America's labour market information system, which is administered by the Employment and Training Administration (ETA), another agency in the US Department of Labor. America's labour market information system links employers and workers through an integrated system that provides information on areas such as job vacancies (America's job bank), workers seeking employment (America's talent bank), and current wages for various occupations (occupational employment statistics). BLS provides its national projections to the states, and each state develops its own

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[6]   Mathematically, the allocation of final demand is $e = Gc$, where e = vector of final demand by commodity sector, c = vector of final demand by product type, G = bridge table in which each column contains the allocation of a product type to commodities in percent terms. The input/output model is: $g = D(I - BD)^{-1}e$, where g = vector of domestic industry output by sector, B = 'use' table in coefficient form, D = 'make' table in coefficient form, I = identity matrix, and e = vector of final demand by commodity sector. See US Department of Labor (1997) for further explanation.

[7]   The most recent industry employment projections are in Berman (2004).

[8]   The CES production function is modified to include a time trend. Labour demand is estimated as a function of industry output, wages relative to output price, and a time trend.

[9]   The latest occupational projections are provided in Hecker (2004).

occupational projections by adapting national data as it sees fit. States' projections are not subject to BLS approval (or approval by any other national entity), and there is no effort to assure that state projections are consistent with national projections ([10]).

Occupational projections data are released in several forums. The major outlet is a series of articles in the *Monthly labor review* every two years. For example, the most recent projections, covering 2002 through to 2012, were published in the February 2004 issue of the *Monthly labor review*. Other outlets include the following (*Occupational outlook quarterly*, Winter 2003-2004, Vol. 47, p. 49):

- a special issue of *Occupational outlook quarterly*, a non-technical publication devoted to presenting information on occupations such as the characteristics, pay, qualifications, and likely future for various occupations. In addition, later issues include specific articles on the projections, including *The job outlook in brief* and *The job outlook for college graduates*;

- the *Occupational outlook handbook* provides in-depth information on about 250 occupations that cover about 87% of the workforce. In addition to describing the occupations in depth, the *Occupational outlook handbook* includes highlights from occupational projections;

- *Career guide to industries* presents occupational information similar to what is in the *Occupational outlook handbook*, but from an industry perspective. The most recent edition of the guide provides information on occupations in 42 industries;

- *Occupational projections and training data* is designed to be useful to career and guidance counsellors. In addition to providing many of the same detailed statistical tables as the *Monthly labor review*, this publication also shows job openings resulting from net replacement needs as well as economic growth, and it indicates the education and training required for each occupation.

In addition, much of the material is available at no cost through the Internet. The *Monthly labor review* articles may all be viewed, printed, and downloaded from the Internet, as may many charts and tables from other sources. In many instances, state occupational projections may also be obtained from the Internet, and there are direct links from BLS and ETA Internet sites to the state projection sites.

2.9.   Measuring occupational skills and other characteristics

BLS defines occupations in terms of the tasks associated with the occupation, and BLS data generally do not include information on skill levels. BLS does measure preparation typically required to enter an occupation, and in some of its outlets, for example *Occupational projections and training data*, BLS lists the entry requirement usually associated with occupations. The BLS classification of training preparation includes 11 categories:

1.   first professional degree required (e.g. medical, dental, or law);

2.   doctoral degree required;

3.   master's degree required;

([10]) Until recently there was also a National Occupational Information Coordinating Committee (NOICC), with counterparts in each of the States (SOICCs), who were responsible for coordinating and disseminating the nation's labour-market information. NOICC and the SOICCs have lost their funding, and their responsibilities were assumed at national level by America's labour market information system and by State employment security agencies at State level.

4. work experience in an occupation requiring a bachelor's degree;

5. bachelor's degree required;

6. associate degree required;

7. vocational training in post-secondary vocational school required;

8. skills developed through experience in related occupation required;

9. long-term (over 12 months) on-the-job training required;

10. moderate-term (1 to 12 months) on-the-job training required;

11. short-term (less than 1 month) on-the-job training required.

One must be careful in interpreting this data, however, because most occupations have no standards for entry, and the BLS classification may not apply very well. For example, registered nurses, classified as requiring an associate's degree, can obtain training in two-year programmes that provide an associate's degree, three-year programmes that award a certificate, and four-year programmes that award a bachelor's degree. Likewise, BLS classifies clergy as requiring a first degree, but in some religions clergy are not required to have any degree.

2.10. O*NET: the occupational information network

Although BLS has not linked skill data to occupational data, ETA, an agency in the Department of Labor responsible for labour exchange and training programmes, has developed and distributed information on skills associated with occupations. Until recently, ETA's occupational data with skill information were issued in the *Dictionary of occupational titles*. ETA has replaced the *Dictionary of occupational titles* with O*NET, the occupational information network. Although neither the *Dictionary of occupational titles* nor O*NET is used to project changes in skill levels for occupations, the two systems show how occupational data can include more than just tasks associated with the occupation (see Barnow, 2002).

O*NET is an online system that characterises over 950 occupations. The occupational data are organised in six broad categories or 'domains', each of which has several subcategories. The six domains and the major subcategories are shown below [11].

(a) worker requirements:

- basic skills (content skills, process skills),
- cross-functional skills (social skills, complex problem-solving skills),
- technical skills (systems skills, resource management skills),
- knowledge,
- education;

(b) worker characteristics:

- abilities (cognitive, psychomotor, physical, sensory),
- interests,

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[11] The classification used by Mariani (1999) differs slightly from what is presented on the O*NET Internet site. In Table 1 the two sources are combined.

- work values,
- work styles;

(c) experience requirements:

- training,
- experience,
- licensure;

(d) labour-market characteristics:

- current and projected employment,
- completions in educational programmes,
- occupational earnings;

(e) occupational requirements:

- generalised work activities,
- organisational context,
- work context;

(f) occupation specific information:

- occupational knowledge,
- occupational skills,
- tasks,
- duties,
- machines, tools and equipment.

This list does not indicate the great level of detail included in O*NET, however. Basic skills, for example, are further divided into content skills and process skills. There are six content skills (reading comprehension, active listening, writing, speaking, mathematics and science), and four process skills (critical thinking, active learning, learning strategies and monitoring) ([12]).

Table 1: Example of categories of information and variables
*provided for the occupation of economists in O*NET*

Category	Examples of variables	Number of variables
Tasks	Compile, analyse, report data to explain economic phenomena	9
Knowledge	Mathematics, economics, education, English	33
Skills	Reading comprehension, writing, monitoring, systems analysis	36
Abilities	Written comprehension, oral expression, number facility	85
Work activities	Updating and using relevant knowledge, getting information, processing information	42
Work context	Indoors, spend time sitting, importance of being exact	39
Interest	Investigative, enterprising, realistic	6
Work values	Achievement, independence, working conditions	6
Work needs	Autonomy, ability utilisation, working conditions	27

([12]) See Mariani (1999) and Peterson et al. (1999) for additional detail on the specific variables captured on each occupation. Also see the O*NET web page (www.onetcenter.org).

To illustrate the level of detail provided, the list below shows the categories of information provided for each occupation and the number of variables in each for economists (Table 1).

In addition, O*NET provides information of the 'job zone', which provides the general category that the occupation fits in, a list of related occupations, and links to data on occupational wage and employment data and the most recent BLS projections.

3. Policy process

This section of the paper describes the relationship between the employment projections programme and the policy/political process. It is quite brief because in the US the process is virtually apolitical. The projections programme is developed by the Office of Employment Projections in the BLS, which itself is a unit of the US Department of Labor. Both the Secretary of Labor and Commissioner of BLS are political appointees of the President subject to confirmation by the Senate, one component of the legislative branch of government. Although a political appointment, the Commissioner of BLS serves for a fixed term and has for at least the past 25 years been a non-political person with expertise in labour statistics. The former Commissioner, for example, was a highly regarded academic before her appointment. The Associate Commissioner for Employment Projections is a member of the Senior Executive Service and for many years the position has been held by career civil servants.

For a brief period in the 1990s, the US government attempted to promote the development of voluntary industry-based skills standards. A national skills standards board was established to promote industry efforts to establish the standards for the skills required for occupations in specific industries. Although standards were established in a few industries, such as hospitality, overall progress was slow and the board became mired in issues having little to do with skills standards. Consequently, funding for the board was eliminated and the skills standards movement has ended, at least for now.

In the absence of a system for establishing and projecting occupational skill requirements, one might wonder how training programmes in the US provide their participants with the skills needed for the job. The current system relies heavily on market mechanisms to promote the production of appropriate skills. The major federally sponsored training programme is the Workforce Investment Act, which funds training and other workforce services to adults, laid-off workers, and youth. Several provisions in the Workforce Investment Act promote the provision of appropriate skills in its programmes:

(a) vendors are generally prohibited from serving participants unless they meet the State and local eligible training provider list requirements for placements and wages at placement for their Workforce Investment Act customers and other customers;

(b) customers for training programmes are provided with voucher-like mechanisms called individual training accounts that permit them to choose, subject to guidance from the local workforce investment agency, the vendor that they believe best meets their needs;

(c) individual training accounts can generally be used only for programmes in occupations with strong projected occupational demand;

(d) local workforce investment agencies have incentives to serve their customers successfully because they are subject to rewards and sanctions if they exceed or fail to meet their performance standards for the programme.

Thus, at this time the US recognises the public value of providing projections of the occupational situation for 10 years ahead, and the system appears to work reasonably well and without political interference. Current occupational attributes, including skill types and levels, are documented through the O*NET programme. At this time O*NET does not forecast changes in skills required for occupations, and changes in skill requirements are noted in the periodic updates of the O*NET database.

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Identifying skill needs in the UK

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The contribution outlines the national system for identifying changing skill needs in the UK, and briefly reviews corresponding work at regional, local and sectoral levels. It mentions the main methods used for assessing changing educational and training needs in the UK at various levels. The recent focus on local assessment of skill needs in the UK has resulted in an explosion of research, with an immense number of detailed studies being undertaken. The chapter describes the changing institutional arrangements for identifying skill needs and delivering education and training, and reviews the significance of such changes in the UK over recent years, focusing on both technical and institutional issues. It also offers a more critical perspective on the role of the State in anticipating changing skill needs.

1.   Introduction

As labour markets and individual employing organisations evolve, so also do arrangements for providing learning opportunities. Indeed, there are markets for learning with increasingly diverse forms of provider institutions seeking both to stimulate and meet demand. Alongside the public education and training systems, private commercial and non-profit organisations have established themselves particularly strongly in certain areas. At the same time, there are many intermediaries playing regulatory, advisory, representative and informational roles. Some have been set up by the State or by regional or local authorities. Others have emerged as private initiatives to satisfy the needs of specific interest groups or wider socioeconomic objectives. All these organisations require some understanding of how the labour market is developing and the impact that this is having on those parts of the labour and learning structures where they are especially active.

Forecasting the labour market, attempting to anticipate the changing pattern of demand for skills, is not just a technical matter. It is fundamentally influenced by institutional factors. The success of the activity can be as much due to how it is organised as to how it is handled at a technical level. The institutional framework within which such work is carried out, together with the 'statistical infrastructure' upon which quantitative models are founded, determine key features of such projections. There have been many advances in data collection, storage and manipulation in recent years that have revolutionised what is technically feasible. These have benefited all countries. Changing institutional arrangements for the identification of skill needs and for the delivery of education and training can play an equally important role in shaping what forecasting work is undertaken and how it is used.

This contribution outlines the national system for the identification of changing skill needs in the UK, and also briefly reviews corresponding work at regional, local and sectoral levels.

It describes the most significant institutions directly involved in the funding, coordination, regulation and delivery of education and training, with some brief reference to the legal background, together with other key stakeholders.

It then provides a summary of the main methods used for assessing changing educational and training needs in the UK. These range from general assessments at national level to sectoral studies and local analyses. The review covers the broad range of methodological approaches, adopted in the UK to address these issues. The recent focus on local assessment of skill needs in the UK has resulted in an explosion of research, with an immense number of detailed studies being undertaken. Over the past 10-15 years, there have been literally hundreds of small-scale studies commissioned by local learning and skills councils (LSCs), their predecessors (the local training and enterprise councils, TECs), economic development agencies, partnerships and local government bodies. No attempt is made to provide a comprehensive survey of all these, but some commentary on the approaches taken is given.

It then returns to the roles of the key actors and deals with the principal modes of technical support set up for them by the government to assess changing skill needs in the UK. It also offers a more critical perspective on the role of the State in the process of anticipating changing skill needs.

It rounds off the chapter with some concluding comments.

2. The UK context: institutional background

The institutional arrangements for developing policy and regulating and coordinating provision of education, training and lifelong learning are described in this section. The first part looks at government departments and public agencies involved in the funding, coordination and regulation of education and training in the UK; the second part briefly focuses on education and training providers; this is then followed by a review of the other key stakeholders concerned with learning provision and the skills agenda; the section, finally, discusses the organisation of careers guidance which thus moves away from policy and practice in the provision of education and training to the intermediaries who offer information, advice and guidance on what opportunities are available and what to pursue.

2.1. The State/government and public agencies

In recent years the UK has moved towards a more decentralised system of government, with the establishment of devolved administrations in Scotland, Wales and Northern Ireland. Each of these has have been given their own legislatures the Scottish Parliament, the Welsh Assembly and, though currently suspended, the Northern Ireland Assembly ([13]). The first of these has substantial jurisdiction over internal affairs, including the power to raise taxes. All three, however, are responsible for education and training arrangements within their domains with their own education departments, etc.

There is, as yet, no regional government in England. The failure of the referendum in the North-East (held in 2004) to support the setting up of an 'elected' regional assembly led the government to reconsider, if not abandon, its plan to actively promote English regional devolution. The UK central government continues to be responsible for these regions

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([13]) Since October 2002, the Northern Ireland Assembly has been suspended and the work of all Northern Ireland departments is the responsibility of the Secretary of State for Northern Ireland.

reporting to the national parliament in Westminster. Nevertheless, 'appointed' regional assemblies continue to exist and now have responsibility for the work of regional development agencies which are playing an increasingly important role in economic development within England, including having a direct concern with skills issues.

The main national government (UK) departments with an interest in education, training and skills are:

(d) the Department for Education and Skills (DfES);

(a) the Department for Work and Pensions (DWP);

(b) the Department of Trade and Industry (DTI).

More recently the Treasury and the Office of the Deputy Prime Minister have also taken a stronger interest in such matters. The former is concerned primarily with macroeconomic issues, including the links between skills, productivity and performance. However, it has sought to influence substantially the skills debate at virtually all levels from basic skills (literacy, numeracy, competence in using IT) for adults as well as young people through to graduate skills, alongside the science and technology agendas relating to them. The Office of the Deputy Prime Minister has been more concerned with the local dimension and issues of regeneration and local economic development, including implications for housing policy.

2.1.1. *Quasi-governmental bodies, including regulatory and awarding institutions*

Since the 1980s it has been government policy to transfer major operational functions from central departments, which, none the less, retain overall control of policy and funding, to a range of executive agencies or non-departmental public bodies. The most important of those having responsibilities concerned with education and training and operating under the umbrella of the DfES – or DWP where specifically indicated – are the following:

(a) national funding councils:

  (i) Learning and Skills Council (LSC): as from 2001, the LSC has been the central agency responsible for the funding of all post-16 education and training provision (excluding higher education). This also involves coordinating a network of local LSCs that commission government-sponsored learning provision at local level;

  (ii) Higher Education Funding Councils (HEFCE for England, etc.);

(b) national regulatory bodies:

  (i) Qualifications and Curriculum Authority (QCA): the regulatory body for standards, curricula and external qualifications in all parts of the general and vocational education and training systems (except higher education);

  (ii) Sector Skills Development Agency (SSDA): the coordinating body for the sector skills councils (SSCs), with responsibility for setting targets and regulating their operations. This includes the development and certification of national occupational standards, subject to the overall responsibility held by the QCA;

  (iii) Office for Standards in Education: the inspectorate responsible for standards of school and college education and training provision;

(iv) Adult Learning Inspectorate: responsible for inspecting private training organisations providing learning programmes supported by public contracts;

(c) other bodies:

(i) Jobcentre Plus, responsible for job placement and the payment of working-age social security benefits – an executive agency of DWP;

(ii) Office for National Statistics (ONS) is an executive agency responsible for collecting and publishing almost all official statistics for the UK;

(iii) national advisory bodies – generally ad hoc bodies set up to advise central government on strategic directions and/or potential organisational change (e.g. National Skills Task Force – NSTF) or for a period while a particular policy is in place (e.g. New Deal Task Force).

Thus, the DfES is currently the national government department primarily responsible for skills-related labour-market issues and learning provision. It is responsible for collecting and analysing data on the labour market and learning as well as carrying out evaluations of specific training programmes and policy initiatives. It has overarching responsibility for both the LSC and the SSDA. The DfES commissions a range of research on the labour market, including formal assessments of future skill needs. It is also responsible for various aspects of primary data collection such as the labour force survey (although the survey is actually conducted by the ONS). The LSC and SSDA also commission data collection and research relating to their prime tasks, sometimes in collaboration with the DfES.

Other arrangements apply in Scotland, Wales and Northern Ireland, including institutions for monitoring and assessing changing skill needs such as Future Skills Scotland, Future Skills Wales and the Northern Ireland Skills Unit.

There follows further comment on the functions of the main agencies listed above:

(a) The **LSC**'s budget is huge, of the order of GBP 9 billion. It acts through its 47 local branches. From 2001, these replaced the previous TEC which were commercial companies set up under licence from the government and largely employer-driven. The latter were under contract to deliver national employment and training programmes at the local level. Previously they had been run by national agencies without a local organisational structure but working in collaboration with the local offices of the (then) Employment Service and Department of Social Security.

(b) The **QCA** resulted from a merger of the bodies regulating curriculum development, standards and accreditation for both academic qualifications and National Vocational Qualifications (NVQs) ([14]). General educational qualifications and vocational qualifications

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([14]) During 1986-97, the national accreditation agency specifically responsible for overseeing the development, implementation and quality assurance of NVQs throughout the labour market was the National Council for Vocational Qualifications (NCVQ). NCVQ was established in October 1986 following a government white paper in July 1986. Although a public body, its legal basis was as a (non-profit making) 'company limited by guarantee', with a board appointed by the Secretary of State for Employment in consultation with those for Wales and Northern Ireland. In October 1997, under arrangements set out in the Education Act 1997, the NCVQ was wound up and its responsibilities were merged with those of the School Curriculum and Assessment Authority within a new statutory agency, the QCA.

are certificated throughout the UK by bodies which are independent of government but regulated by government agencies. Vocational qualifications in England are awarded by independent awarding bodies, approved and regulated by the QCA. These bodies are independent and sometimes specific to the sector(s) in which they operate. They normally have a status as non-profit making bodies. For NVQs there are currently about 40 awarding bodies; these are widely used in Wales and Northern Ireland as well as in England.

National occupational standards are set by SSCs or national training organisations (NTOs), the sectoral employer-led bodies designated to carry out this role by the DfES. They are coordinated by the SSDA but, under current arrangements, the national occupational standards programme is managed and funded by QCA in conjunction with the SQA, its Scottish equivalent.

QCA's statutory functions span both general and vocational education and include policy advice to the Secretary of State for Education and Employment and regulation of: 0-5 early years education; the 5-16 national curriculum, statutory tests and publicly funded qualifications; all 16+ general and vocational qualifications (with the exception of university qualifications). QCA regulates external qualifications – those qualifications that are awarded by a body other than the institution in which they are offered. Accreditation by QCA indicates that a qualification has been approved for inclusion in the national qualifications framework of qualifications and, as such, has met exacting criteria.

Statutory regulation is used to safeguard the public interest where other mechanisms – including awarding bodies' own quality assurance arrangements – would not be sufficient to ensure proper maintenance of consistent standards across awarding bodies and over time.

The Secretary of State for Education and Skills, acting on the advice of QCA, is responsible for approving qualifications that may be offered within the public education system of England (under the provisions of the Education Act 1997 as amended by the Learning and Skills Act 2000 ([15])). Similar provisions apply for Wales and Northern Ireland. These provisions apply to any qualification for which learning provision is supported through public funds. All approved qualifications must be accredited by QCA within the NQF, and the DfES publishes the list of approved qualifications.

It should be noted that, at higher education level, the NQF overlaps with the framework of university qualifications regulated by the Quality Assurance Agency, an independent body funded by its member higher education institutions.

(c) **SSDA and the SSCs – the skills for business network.** There has been radical change in the institutions charged with taking a responsibility for sectoral interests over the past 40 years. During 1964-88 the UK had a system of sector-based Industry Training Boards (ITBs). These had statutory powers to raise a training levy on the companies defined as being 'in scope' to them, which was based on the number of employees in each company. The ITBs collected data on the occupational structure and the volume of training undertaken, since this was linked to the analysis of their administrative returns. One of their duties was to forecast future training needs and to ensure that sufficient training was available to meet these needs. ITBs were set up for a wide range of sectors. Probably the

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([15]) *Learning and Skills Act 2000.* Available from Internet: www.hmso.gov.uk/acts/acts2000/20000021.htm [cited 30.8.2005]

most important of these were the Construction Industry Training Board and the Engineering Industry Training Board. The ITBs were largely disbanded by the conservative government when the TECs were established in the late 1980s. As a result, these valuable sources of data no longer exist. However, both the Construction Industry Training Board and the Science, Engineering and Manufacturing Technologies Skills Council (the successor to the Engineering Industry Training Board) have actively pursued the development of tools to enable them to anticipate future skill needs. These are discussed in more detail in Section 3 below.

A considerable proliferation of sectoral bodies took place in the 1990s, primarily to reflect employers' views – well over 100 were in operation with very specific sectoral remits. The system appeared to be too fragmented to deliver the key broad objectives identified by government. These included:

(i)   greater international competitiveness;

(ii)   improved workforce performance comparable with 'world-class standards';

(iii) a rationalised, simplified and transparent system of qualifications intended to raise the status of vocational education;

(iv)   breaking down unnecessary barriers to transfer across courses;

(v)   promoting progression to support greater workforce flexibility and mobility.

The labour government, as with its conservative predecessors was firmly committed to an approach based on the principle of voluntarism. However, to develop the occupational standards and define the qualification needs of each sector, it had to stimulate the development of new sectoral bodies. Hence the creation of the SSDA and the related SSCs. Together the SSDA and the SSCs are now referred to as the skills for business network. Wherever possible the SSCs have been built upon existing structures such as employer interest groups or trade associations. The government has used a mixture of exhortation and financial incentives to achieve the reforms that they sought.

By spring 2005 some 24 SSCs had been established. Many of these new SSCs cut across traditional industry boundaries, reflecting the interests of their members, which often run along 'supply chain' lines rather than within the standard industrial classification (SIC) boundaries favoured by statisticians.

(d) **Jobcentre Plus.** Launched in 2002 on the merger of the Employment Service and the Benefits Agency; the former was responsible for placing people in work (especially those on benefits) and administering employment and training schemes (such as the New Deal); the latter for assessing eligibility for social security benefits (including jobseeker's allowance) and making payments.

By 2006, it is intended that the local networks of Jobcentres and social security offices will become fully integrated. The aim is to provide a more effective service giving integrated employment and benefits advice to individuals, delivering a streamlined New Deal and other programmes to disadvantaged people of working age and continuing to offer recruitment and general labour-market advisory services to employers. This modernised form of public employment agency and social security provision is a major source of administrative microdata on the labour market and adult vocational learning, as

well as being a substantial user of local labour market information and intelligence (LMI) and skill needs assessments.

2.2. Education and training providers

Britain has a very diverse range of training providers. Vocational education and training policy places a heavy emphasis on 'end-qualifications' (NVQs at different levels, 1-5), rather than the process of acquisition *per se*, and the same qualifications can be offered via public, private and employer-based provision.

The colleges of further education, of which there are more than 200 in England, are the main providers of VET to young people, often in conjunction with local employers who provide work placements. Colleges are funded through the local LSCs, and have to compete for contracts with private training providers. Private training providers are numbered in many thousands. The pattern of provision varies widely between sectors. For example, most NVQ and Modern Apprenticeship provision in construction is offered through colleges, whereas in retail distribution, it is offered mainly through private training providers or by large employers.

Higher education offers academic and vocational qualifications that are deemed to be at NVQ levels 4 or 5; vocational qualifications at this level are not very significant in numerical terms and are largely confined to those universities that, prior to 1992, were designated as 'polytechnics'.

2.3. Key actors: other stakeholders

While those organisations concerned with the funding, coordination, regulation and delivery of education and training are obviously crucial participants, various other actors play important roles or have interests in the anticipation of education and training needs. These include regional and local bodies, employers, unions and individual citizens and members of their households.

2.3.1. Regional and local bodies

Several organisations with regional or local identities are concerned with the skills agenda but their remit extends well beyond education, training and employment matters.

Regional organisations:

(a) government offices in the regions;

(b) regional development agencies;

(c) other development agencies at regional level.

Local organisations concerned with various aspects of policy delivery in the education, training and employment field:

(a) business partnerships;

(b) New Deal partnerships;

(c) careers services;

(d) national health service workforce development confederations.

Other local or subregional organisations with wider functions but usually involved in the education, training and employment field:

(a) local authorities;

(b) chambers of commerce;

(c) economic development partnerships.

Efforts have been made to avoid confusion over roles and duplication of work (especially in data collection and analysis relating to skills) at the regional and local level through concordats agreed by the DfES, DTI, DWP and the relevant regional development agencies. These are called frameworks for regional employment and skills action and there is one for each region.

2.3.2.   Employers

The Confederation of British Industry is the main national employers' body, to which most of Britain's large employers are affiliated. Other important employer bodies are the British Association of Chambers of Commerce and the Federation of Small Businesses, which are especially important as voices for small and medium-sized enterprises. The Institute of Directors is an influential pressure group that also speaks on behalf of employer interests.

Trade associations and professional associations also play an important role in some sectors. Some of the latter are akin to trade unions for the highly qualified professions, but others also have special statutory status because of their role in regulating the professions concerned in the public interest. Increasingly, such bodies have come under pressure from government and the public to introduce more rigorous standards of conduct and competence; this has involved paying special attention to continuing professional development and periodic formal 're-validation' of professional competence, as well as maintaining entry standards and modernising initial training.

Many employers' organisations, including the Confederation of British Industry and some of the more sector-based organisations conduct their own surveys of members, particularly of their perceptions of skill shortages. It is important to note, however, that such responses are often passed into public debate without much critical reflection. Employers tend to play down the possibility that there are qualified workers who could be recruited but the employer is not willing to pay the appropriate wage or to attend to other conditions of employment which discourage potential recruits from applying for jobs.

2.3.3.   Unions

The majority of Britain's trade unions are affiliated to the Trades Union Congress, which is the only national trade union federation. There are separate Scottish and Welsh Trades Union Congresses. Trade unions in Northern Ireland are mostly affiliated to the Northern Ireland Committee of the Irish Congress of Trade Unions. Trade union membership fell sharply in the 1980s with growing unemployment levels and legal restrictions on trade union freedoms, from a peak of 13.2 million in 1979 (the year the conservatives were first elected) to its lowest point of 7.8 million in 1997 (the year the conservatives left office). It had only risen slightly to 7.9 million by 1999 (Sneade, 2001).

Compared to many other European Union countries the role of trade unions in the UK as a social partner involved with the development and regulation of training is limited, having

been progressively marginalised since the 1970s (at which time they had more or less equal status with employers on State-sponsored industrial training boards and the Manpower Services Commission).

2.3.4. Reactions of the social partners to the creation of the SSDA/SSC

The SSDA/SSC initiative was generally welcomed by the social partners with some enthusiasm. For employers, the system represented a business-led approach, putting ownership of standards and qualifications firmly into the hands of employers. For trade unions, previously undermined by high levels of unemployment and the dismantling of most of the formal structures that provided a means of influencing industrial and training policies, the new system offered a means of enhancing their members' employability. They provided new forms of access to qualifications, based on formal recognition of skills acquired throughout working life, together with an opportunity to become involved in influencing an important new government initiative. Though initially sceptical, training providers quickly saw the changes as offering new opportunities to extend their provision to meet the needs of a whole new constituency of people who, until then, had not been participating in formal vocational education and training provision. This enabled an expansion of training provision at a time when it might otherwise have been reduced as a result of demographic changes.

However, the extent to which the hopes generated by these changes in vocational education and training have been realised is debatable and may be as much dependent on the willingness of the government to allow the organisational structure to stabilise and to concentrate on promoting behaviour within those structures which is consistent with its overall objectives. Part of that behaviour should be devoted to achieving the highest standards of LMI and effective access to it. Meanwhile, the current debate has shifted somewhat to secondary education and especially its role in education and training pathways and attainment relating to the 14-19 age group.

2.3.5. Individuals and households

There is a general requirement and an assumption throughout England's systems of qualifications and learning provision that the needs of individuals are recognised and catered for though a flexible, tailored and learner-centred approach. This is enshrined in various notes of guidance and in policies on equal opportunities, access, etc. Whether this happens in reality is mainly determined by the practices of learning providers and assessment centres, although these are inspected and monitored.

There are few formal mechanisms for providing recognition of the interests of individuals. As noted above, trade union representation mechanisms are quite weak. There are also some arrangements at the level of individual education and training institutions for involving students or learners (and, in some cases, parents) in consultative mechanisms.

However, considerable government effort has been devoted to making the performance of education and training providers much more transparent. This has led especially to extensive quality assurance and assessment systems and the production of 'league tables' in national newspapers showing the rankings of different schools, colleges and universities. Although designed to show individuals and their parents how well institutions that they might enter (or are already attending) are performing, there is considerable controversy over the resources

devoted to the assessment process, the 'fairness' of the rankings and their negative effects on less measurable educational and social outcomes.

As regards lifelong learning, so far there is evidence of only weak demand from individuals not sponsored by their employers, or falling into the categories (mainly young people or unemployed) qualifying for State sponsorship, for qualifications-based lifelong learning, with the possible exception of higher education 'open learning' provision.

2.4.   Career guidance and related institutions

Of considerable potential importance to individuals is the part which high quality career guidance can play in helping them to make the transition from full-time education into the world of work and then deploy their talents in the labour market. Until quite recently such advice was provided primarily through local government in collaboration with schools. Careers guidance was partly 'privatised' in the 1980s through competitive tendering for local authority career services, imposed by the conservative government, in the course of which many contracts were won by private-sector companies, rather than in-house bidders. A by-product of this development was that more attention was paid by the whole careers sector to the quality of local LMI available, the methods of presenting it so that it could be accessed more effectively by advisers, and the training of advisers in how best to use it.

In 2000, the 'Connexions' service was formed. This was intended to provide 'connected' thinking about the whole process of transition from full-time schooling, through further education on to higher education and the world of work. Based on a holistic approach involving various social agencies, as well as more traditional career guidance, it covers the whole of England and is responsible for information, advice and guidance to 13-19 year olds. The service is provided by private companies licensed by the DfES.

Several the newly privatised career guidance companies took an active interest in anticipating future labour-market conditions on behalf of the clients they advised. Moreover, education and learning suppliers (colleges, universities, etc.) have been charged with the responsibility for ensuring that the courses they provide are relevant to future labour-market needs which places a further premium on good LMI.

Career guidance for those aged 19+ is covered by other private sector companies (the Adults Guidance network). This is a network of privatised institutions, often based on partnerships with local agencies, and effectively operating under licences let by the DfES. They offer information, advice and guidance to all adults. Universities and other institutions of higher education also provide an increasingly comprehensive careers service for their undergraduate and postgraduate students, often combined with taking leadership for developing the 'transferable skills' training element that is now a familiar supplement to the mainstream academic curriculum.

The national guidance research forum website ([16]) was launched in 2004 by the Warwick Institute for Employment Research (IER), in collaboration with the University of Derby's

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([16]) Available from Internet: www.guidance-research.org [cited 30.8.2005].

centre for guidance studies. There is also a 'strategic group' for the forum for which the Guidance Council provided the secretariat. This initiative has been funded by the DfES. Part of the role of the website is to make available LMI in a suitable form for use by an increasingly heterogeneous group involved in giving guidance – ranging across, for example, careers guidance professionals, teachers in schools and colleges, New Deal personal advisers, to trade union learning representatives.

3. Methods used to assess education and training requirements in the UK

3.1. The importance of institutional context

There are significant differences between countries in the approaches to education and training provision and how these should be related to anticipated changing skill requirements. These differences reflect both different cultural, historical and institutional backgrounds, which influence the general approach to such problems, as well as more specific differences related to data availability which can constrain what is technically feasible.

In some countries, there have been attempts to plan the educational and training system in great detail. This approach has never been a central feature of UK work on labour-market forecasting, although some of the earliest attempts were primarily aimed at providing information for policy-makers rather than other labour-market participants. More recently, the focus has changed to provide a broader range of LMI of value to many (if not all) of the actors described in Section 2.

Generally speaking, the UK is relatively well-served in the quality of labour-market data, although specialists will always argue the case for further improvements.

3.2. Approaches to anticipating training requirements in the UK

Various methods and approaches have been used to anticipate education and training needs in the UK. This section focuses on national level. No attempt is made here to provide a comprehensive review of all the studies undertaken, especially at sub-national level. Rather the emphasis is on providing some key insights, with a few examples [17]. These include examples based on the use of both quantitative methods and qualitative approaches. It also highlights various improvements in modelling techniques that have been facilitated by the availability of better data as well as increased computing power.

As noted in Section 2, the DfES (as its predecessor the Department for Education and Employment – DfEE) is the national government department responsible for labour-market and skills-related issues. It has for many years collected and analysed labour-market data based on a range of different sources (unemployment statistics, estimates of employment vacancies, pay and other key labour-market indicators. These are collated and published in *Labour market trends* (formerly *The employment gazette*) and related publications. In

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[17] For more extensive reviews, see Wilson (2002), Lindley (2002) and Wilson et al. (2004a).

addition, the DfES is responsible for commissioning the *Labour force survey* (LFS) as well as various other surveys of labour-market conditions and evaluations of specific training programmes and policy initiatives ([18]).

DfES has also supported the development of the national online manpower information system (NOMIS) providing online access to labour-market information via the Internet. This includes all the major data sets for which DfES is responsible, including the LFS. Section 4 presents a more detailed discussion of the various technical means of support for anticipating skill needs offered by the State.

The DfES has in the past itself also carried out some analysis of data, but in recent years most of this has been commissioned from external organisations which specialise in research on the labour market. This work includes forecasts of future labour demand. Such work has usually been undertaken by academics and commercial consultants. In particular, the IER has received support for developing and running a detailed econometric forecasting model of the national economy over many years. This resulted in the production by the IER of various reports examining future trends in the labour market, including most recently the *Working futures* series (Wilson et al., 2004b). This programme of work is summarised below and, in more detail, by Wilson (2001a) and Lindley (2002).

3.3.   Alternative methodological approaches

There has been a large variety of approaches to anticipating changing skill needs worldwide. These have tended to reflect perceptions of both what is desirable, as well as the practical limitations of what is feasible. Both of these have changed substantially over the past 50 years.

From the earliest attempts, those engaged in such work have adopted model-based, quantitative methods wherever possible, simply because quantitative results have been seen as a key output required by potential users of the results. The use of formal models has been advocated on various grounds, as detailed below. However, the merit of alternative, more qualitative methods has also been recognised (Lindley, 1994b).

Current work in this area is still very much constrained by data limitations. What is feasible in different countries is limited by their 'statistical infrastructure'. Some countries, such as the US, have been engaged in this kind of work for over 50 years. The sophisticated analysis conducted there has been based upon very substantial prior investments in statistical surveys and data sets as well as modelling capacity. In contrast, in some other countries, where the same levels of investment have not been undertaken, the data to develop such quantitative models simply do not exist. In such cases alternative approaches have been developed. While these approaches can provide some useful insights, they are generally regarded as useful complements to the more fully-fledged, model-based projections, rather than as substitutes for them.

The methods used differ significantly according to the purposes, the audience and the data available. Such work has become progressively more scientific and quantitative as methods, tools and data have improved.

([18])   The LFS, in common with other official surveys, is organised by the ONS.

Key elements of statistical infrastructure which are present in the UK and which have enabled and facilitated various quantitative approaches to anticipating future skill needs are summarised in Section 4.2 below. They include: a well-established system of national accounts; standard systems for classifying both industries and occupations; regular surveys of industry and occupational employment; and the capabilities of collating and deploying the information in a logical and consistent fashion in the form of quantitative models of the economy and the labour market.

3.4. General approaches

The most frequently used approaches to anticipating future skill needs can be grouped under four main headings:

(a) ask employers (employer skill surveys, etc.);

(b) quantitative models (formal, national level, quantitative, model-based projections);

(c) sectoral studies;

(d) primarily qualitative methods (focus groups/round tables and other Delphi-style methods, including setting up 'observatories' and scenario development (these may include some quantitative aspects but are generally more qualitative).

Each of these approaches has its own strengths and weaknesses which are summarised in Table 1.

3.4.1. Ask employers

In many ways, it seems that the most natural approach to finding out about future skill needs is to ask employers. This can involve questions about:

(a) current skill deficiencies;

(b) anticipated future change.

At one time, this approach was a popular technique in the UK. However, it soon became apparent that employers are often not very well placed to provide robust answers to such questions. Their responses are more often than not inconsistent and misleading, especially when concerned with the future. They also tend to be myopic. More recently, greater emphasis has been placed on using employer surveys to assess current skill problems rather than anticipated future requirements. This is discussed in more detail in the next subsection.

3.4.2. Quantitative modelling

The basic methods adopted for quantitative modelling can be classified under the following headings:

(a) extrapolation of past trends;

(b) more complex time series methods;

(c) introducing behavioural content.

Extrapolative techniques are often used, especially where only very limited time series information is available. In fact, in many cases, only one or two observations are available on occupational structure and this clearly limits the sophistication of what can be done! Where more time series observations are available, much more sophisticated analysis is possible,

which attempts to find patterns in a time series that can be used to predict its future path. Such approaches are widely used in the business and financial world, although they are much better at predicting short-term change than longer-term patterns.

Unfortunately, history suggests that most linear (or more complex) trend patterns eventually come to an end and they should therefore not be relied upon for medium to long-term forecasting. Behavioural analysis is an attempt to move beyond patterns in observed time series data and to provide some understanding of how it is that these patterns have arisen and, more importantly, why they may change in the future. Such behavioural analysis draws upon disciplines such as economics and sociology for an understanding of what influences the behaviour of the key actors in the economy and how this is reflected in the main economic and social indicators that can be measured.

Table 1: Comparison of the pros and cons of alternative approaches to anticipating skill requirements

Alternative approaches	Advantages	Disadvantages
Surveys of employers or other groups, asking about skill deficiencies and skill gaps	Direct 'user/customer' involvement	May be very subjective Inconsistent Myopic Can too easily focus on the margins (i.e. current vacancies) rather than skill gaps within the current workforce
Formal, national-level, quantitative, model-based projections	Comprehensive Consistent Transparent Quantitative	Data hungry Costly Not everything can be quantified May give a misleading impression of precision
Ad hoc sectoral or occupational studies (using various quantitative (model-based) and qualitative tools)	Strong on sectoral specifics	Partial Can be inconsistent across sectors
Focus groups/round tables and other Delphi-style methods	Holistic Direct 'user/customer' involvement	Non-systematic Can be inconsistent Can be very subjective

Such understanding finds representation in computerised 'models', which take the form of algebraic equations linking key variables. A model is an attempt to provide a simplified representation of reality that can help understanding of the phenomenon of interest (in this case changing patterns of the demand for skills in the labour market). Most are familiar with the idea of engineers building models to test out their ideas. For example, testing model aircraft in wind tunnels. Models in the social sciences are rather more like a biological analogy than an engineering one, where for example, scientists have built models of dinosaurs to try to understand how they could fly. Social systems are much more akin to the biological than the engineering model. Social scientists attempting to understand how societies and economies work face problems such as:

(a) lack of fixed laboratory conditions;

(b) lack of good experimental data (they can only observe outcomes).

Social science models are typically built using quite sophisticated statistical and econometric techniques. They are based on data drawn from largely official, sources, including National Accounts and related estimates of employment based on surveys of employers and of households. The UK experience in these areas is discussed in more detail in the next sub-section.

3.4.3. *Sectoral studies*

All of the above information has also been used to form the cornerstone of 'sectoral assessments'. But these often involve a broader range of different methodologies and actors, to 'triangulate' a view of the key problems and likely future developments from various different perspectives. Such assessments have in recent years often also had a strong geographical focus, with the setting up in many countries of sectoral and regional observatories and similar mechanisms to monitor changing skill needs at a more local level.

Sectoral specific studies often have considerable advantages in terms of the specific knowledge and insight that they can draw upon to assess current and future skill needs. On the other hand, there is a danger that they can become too parochial and present only a partial picture which fails to take proper account of the wider socioeconomic context.

3.4.4. *Qualitative methods*

Sectoral analyses often also involve a range of 'non-quantitative' methods. Such qualitative techniques include the use of in depth interviews with key stakeholders, including employers, in-depth case studies (especially of particular sectors). These are often combined with focus groups, round table discussions and similar mechanisms, to enable 'soft' qualitative data to be incorporated into thinking about such issues alongside the 'harder' statistical information upon which most quantitative analysis is based.

3.5. Quantitative modelling in the UK

For many years the dominant technique in the UK has been quantitative modelling, using a combination of behavioural/econometric models and more basic extrapolative techniques (where the data are inadequate to apply more sophisticated methods). Pioneering work in this area was conducted for the Engineering Industry Training Board (Wabe et al*.,* 1974). This was followed by the development of national models covering all sectors (Lindley, 1978 and 1980). The prime focus was on projecting occupational employment levels. The most recent studies have laid increased emphasis on modelling replacement demands, and the need for qualifications and generic skills (Wilson, 2000, 2001b; Wilson et al., 2004b).

The national employment projections for the UK produced by the IER were for many years the only source of detailed skill forecasts available in the UK. The institute has been at the forefront of developments in this area since the late 1970s. These projections have been widely used and quoted, not just within the government department which sponsored the original work but across a broad range of different users including TECs, local authorities and other bodies. They have therefore had considerable influence on opinion.

A detailed description of the overall methodological approach is given in Wilson (1994). The macroeconomic model used is described in detail in Barker and Peterson (1987) and Barker (1989). It has a Keynesian structure incorporating a Leontieff input-output system and concentrates on

the determination of changes in the real sector of the economy. The level of disaggregation of commodities and industries is considerable by the standards of other models of the UK economy, some 40-50 sectors being distinguished (depending upon the vintage of the model).

In 1999, following recommendations from the NSTF, a new series of projections was produced. These were carried out by the IER and published in a series of documents called *Projections of occupations and qualifications*. These results were made available via the Internet as well as being disseminated by more conventional means (see Wilson 2000 and 2001).

The most recent UK national projections were commissioned by the Sector Skills Development Agency (SSDA) in partnership with the Learning and Skills Council (LSC). These organisations represent the broader interests of UK national government, as well as regional bodies. These latest projections include an unprecedented amount of detail, with consistent results for almost 70 industries down to the geographical level of 47 LSC areas. These new projections were published in the autumn of 2003 (Wilson et al., 2004b). A new set is currently in preparation.

3.6. Use of employer skills surveys in the UK

Employer surveys have been used at various times to try to obtain useful information on current and anticipated future skill needs. This has included studies of specific sectors such as engineering as well as more general studies. While these were able to obtain some useful insights, problems with inconsistency, myopia and lack of a firm theoretical rationale limited their value for projecting future skill needs. More recent work has emphasised the need for surveys to recognise these limitations and to be complemented by other kinds of data if they are to provide useful intelligence.

Following recommendations from the NSTF, DfEE commissioned a programme of research intended to examine the extent, causes and implications of skill deficiencies (ECISD). The primary stimulus for the ECISD research was the requirement of the NSTF for reliable and comprehensive information on skill needs and skill deficiencies. An additional stimulus was the need to provide information on the geographical pattern of skill needs and problems for the newly established regional development agencies.

Previously, the DfEE's main historical source of skills information was the Skill needs in Britain survey. A major limitation of the Skill needs in Britain survey was that this survey relied on relatively simple measures of employer perceptions and responses to questions asking if they have recruitment difficulties and skills problems. This presupposes that employers can fully assess and articulate their skill needs, whereas it is known from other research that this is not always the case. Also, the Skill needs in Britain survey's limited sample size meant it could only provide simple analyses of skills problems by region. It was not able, for example, to give a breakdown by industry in each region.

The ECISD research programme comprised four major elements: a series of case studies, intensive (face to face) and extensive (telephone) employer surveys and a detailed econometric analysis of the results from the two surveys.

The extensive survey was repeated in 2001 and, on a much smaller scale, in 2002 (just 4 000 interviews). These surveys were subsequently rebadged as the employers' skills surveys. They have spawned a number of detailed reports and analyses ([19]). The results of the ECISD and the employers' skills surveys research have made a major contribution to the evidence base on skill deficiencies, their causes and consequences in the UK.

In 2003 the LSC commissioned a further round of employer skills surveys at both national and local level, involving an overall sample of around 68 000 establishments in England. The first was undertaken in 2003. A smaller survey of around 27 000 establishments was undertaken in 2004 with another much larger survey planned for 2005.

Some of the earlier surveys were criticised for placing too much emphasis on the margins, with the focus on the quite small proportion of employers experiencing serious skill deficiencies (typically only around 1 in 20). Mason and Wilson (2003), among others, argued that there was a need to place greater emphasis on the main body of skill needs rather than just at the margin. The employers' skills surveys has now addressed these concerns to some extent, including questions designed to measure the overall structure of skill demand, but the focus of much of the more detailed questioning remains on the small proportion of employers reporting current recruitment difficulties rather than employers' skill needs more generally.

3.7. Accuracy, evaluation and value of methods for anticipating future skill needs

The present review suggests there is various well-established mechanisms within the UK that have been used for analysing, identifying and forecasting labour-market trends and skill needs. However, the reliability and accuracy of the estimates and projections has often been questioned though an independent assessment of the IER's projections (Haskel and Holt, 1999) was generally positive.

Certainly, the estimates of skill deficiencies based on some of the earlier national surveys (often adjusted to reflect regional conditions) may be questioned. Moreover, the fragmentation of the TEC/LEC (Local Enterprise Councils) system meant that the quality of information often varied from one locality to another. With the setting up of the LSC and SSDA there has been greater centralisation, with the aim of benefiting from economies of scale and use of common approaches. This should bring some benefits, albeit at the expense of less variety. However even with the very large surveys now being conducted, it is impossible to obtain statistically precise information across all the dimensions of interest (occupation, sector, geographical area, etc.) simultaneously.

Accuracy is also an issue in forecasting skill needs. Even where forecasting is carried out using quantitative methods, those involved usually stress that such projections should be seen as part of an ongoing process rather than precise predictions of outcomes. None of today's forecasters claim that they can predict the detailed skill needs in different sectors with great quantitative precision and they recognise the importance of incorporating more qualitative insights (Lindley, 1994b). They suggest that they can provide the various participants in the

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([19]) Bosworth et al. (2000 and 2001) and Hogarth and Wilson (2001a and b).

labour market, as well as policy-makers, with useful insights into how labour markets are developing in response to various external influences.

It is important to recognise, therefore, that accurate and precise forecasts are a chimera. The key question to ask is not whether or not such projections are 'accurate', but whether or not they are 'useful'. The revealed preferences of national governments from all over the world, who support such activity with substantial funding, suggest that they are regarded as of considerable value. It is also clear that such work is seen as having a wide variety of different audiences and users, including careers guidance, as well as general labour-market policy formation and planning education and training programmes. With a few notable exceptions, (such as Singapore) few countries now regard such work as resulting in information that can be used to plan the scale and pattern of education and training provision with any precision. Rather it can help to inform all those involved about how economic and other forces are shaping the labour markets and the general implications for those skills that will be required.

Having built such quantitative models and used them to make projections, it is important to recognise what they can and cannot do. They cannot provide:

(a) mechanistic manpower planning;

(b) precise indications of education and training requirements.

But on the positive side, projections can:

(a) help to make assumptions about the future explicit and transparent;

(b) help to enforce systematic and logical thinking;

(c) act as a focus for intelligent debate;

(d) provide a useful counterfactual to assess policy impacts (i.e. what would have happened in the absence of policy interventions?).

4. Role of the State and other actors in anticipating skill needs

The State has played a key role in work on the anticipation of changing skill needs in the UK, although mainly through funding the research and dissemination required rather than through carrying out the work within the government departments or public agencies most concerned. This has involved support for the production of projections at both national and local levels. The State has also provided a great deal of statistical and other infrastructure to facilitate this process. However, there have been major structural changes in government itself and in changes in the location of responsibility for generating new data relating to skills, for the funding of projection work, and for promoting effective access to and use of the resulting material. Concern has been expressed about the loss of corporate memory and a decline in professional commitment within the civil service to sustaining an adequate monitoring and projection activity (Lindley, 2002).

This section, first, briefly reviews the modelling and projection work, primarily that supported by the policy development system; second, takes stock of improvements to the underlying infrastructure on which modellers and forecasters can draw; third, examines what is seen as a failure of administrative culture to create the conditions required for effective production and

exploitation of projections; and, finally, explores the notion of 'dialogue' in relation to work on and with 'projections' and the professional development of staff involved in the process.

4.1. Modelling and projection work in the policy development system

While the State has played a leading role in funding research in this area in the UK, it has shied away from taking a direct role in actually undertaking the work as has been the case in some other countries.

The IER at the University of Warwick has been the main source of medium-term projections of the structure of UK employment since the mid-1970s (see for example, Lindley, 1980; Lindley, 1994a and b; Wilson, 1994; Wilson, 2001a,). The time span of the forecasts is from 5 to 10 years ahead. The IER projections are produced annually and, until 2000, were published in the IER series, *Review of the economy and employment.* For a brief period during the late 1990s Business Strategies Limited produced national projections on behalf of the DfEE. In 2000 and 2001, the IER once again produced national level projections on behalf of DfES (as it became in 2001). These were published by the DfES as *Projections of occupations and* qualifications (Wilson, 2000, 2001a,). This was part of a much larger programme of research for the NSTF which also included major new surveys of employers' perception of skill deficiencies.

Most recently, such work has been commissioned by the SSDA and has resulted in the *Working futures* set of employment projections produced by the IER in collaboration with Cambridge Econometrics (Wilson et al., 2004b). *Working futures II* was expected to be completed during 2005.

The sector dialogues, skills foresights and workforce development planning activities now being promoted in the UK are very much in the spirit of the recommendations of the NSTF (1999, 2000a and b). They offer a potentially stronger platform on which to deliver results from the kinds of labour-market assessment considered here. This increases the chances of engineering a higher quality 'technocratic dialogue' with specialists in the policy and practitioner communities, along the lines described in Lindley (2002) and Section 4.4 to follow.

However, this leaves a problem higher up, more closely related to the policy 'development' system, which the departments concerned with education, training and employment seem to have had difficulties in addressing properly. This is how to define and implement the appropriate role for modelling and projection work at the 'centre' of government rather than how to ensure adequate professionalism among others, notable practitioners in sectors and local labour markets exploiting LMI ([20]).

The bulk of the actual work has been carried out by academic research units and commercial consultancies. The latter have been especially active at the local and more disaggregated levels. The role of the social partners has been very limited. Trade unions have been largely side-lined by successive governments, although they have been given a more active role more recently. This has included representation on many of the new institutions such as LSC, SSCs

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([20]) See Lindley (2000) for further discussion of this point in the context of the EU and the knowledge-based economy.

and regional development agencies, as well as various other forums such as the (temporary) NSTF and the series of skills dialogue events organised by DfES.

Employers, via the various sectoral training organisations, as well as their involvement in the now disbanded TECs, have been given a more active role. In practice this is often limited to being used as a sounding board and being given a channel for communicating their complaints rather than being fully integrated and involved in the process. Many other bodies within the UK now have an active interest in anticipating education and training needs at a sectoral level. So, beyond DfES and the main agencies which are commissioning research such as the SSDA and LSC, there are various sectoral organisations with an interest in skills for their particular sector and local and regional bodies. The national government has played an active role in trying to support this kind of activity by building up various technical means of support.

4.2.   Technical means of support from the State

The UK government has provided technical support for anticipating skill needs in several ways. These include well-established:

(a) systems of national economic accounts, including detailed sectoral data on output and employment;

(b) standard systems of classification for both industries and occupations;

(c) regular national surveys of households and employers, especially regular surveys of sectoral employment;

(d) robust input-output tables;

(e) regular surveys of occupational employment structure (especially the LFS but also including the censuses of population);

(f) the development of means of access to these data sets electronically.

4.2.1.   Classification of industries, occupations and qualifications

Robust and widely accepted systems for classifying economic and labour-market activity are essential if trends are to be accurately monitored and modelled. There has often been criticism of the systems for classifying both industries (the SIC) and occupations (the SOC). Much of this has been misplaced and fails to recognise both the complexities of the issues involved and the enormous efforts made by ONS and others to develop useful means of classifying activities.

Systems for classifying economic activity by sector lie at the heart of the national economic accounts. ONS is responsible for such work in the UK. The current emphasis on the importance of supply chains and on occupational skill needs cutting across sectoral boundaries as defined by SIC has led some to question the value of such systems. However, this fails to recognise their central role in developing a coherent, consistent and complete picture of all economic activities and how these are changing over time. Classifying economic activity systematically is not a trivial matter and before systems such as SIC and SOC are discarded something better than ad hoc solutions needs to be put in their place. The Department for Culture, Media and Sports (DCMS, 2004) has had particular reasons to grapple with these issues where the cultural or creative industries are concerned which have been ill-served by both SIC and SOC.

Until the introduction of SOC in 1990, several different systems were used in the UK (Office of Population Censuses and Surveys, standard occupational classification, 1990). Different surveys and data sets used what were often quite incompatible systems. This made modelling and even simple trend analysis very difficult. Since 1990, DfEE and other government departments have used SOC in all official data collection. A software package, arising out of a Warwick-Cambridge collaboration, has been developed to help users to code occupational titles into the SOC system (Elias et al., 1993).

Although many people have reservations about SOC, it has undoubtedly been a significant improvement on what went before. A revised version of SOC (SOC 2000) was developed for use in the UK population census in 2001 and in all other official data collection thereafter. The SOC system is designed to consider the amounts of education and training normally regarded as necessary to undertake different jobs.

Attempts have also been made to standardise the classification and treatment of qualifications. This has involved the establishment of a new institutional framework as well as a new system of classifying and accrediting vocational qualifications. In contrast to occupations, these systems are much less well-established, particularly with regard to the development of long runs of historical data which can be used to develop models and establish likely future trends. In October 1991, the newly formed National Council for Vocational Qualifications (NCVQ) published a *Consultation paper on proposals for general national vocational qualifications*. In September 1993 pilot courses were launched in colleges. From September 1994, these general national vocational qualifications courses set new standards, though they were not without their critics (see for example, Smithers, 1993; Prais, 1989, 1991).

4.2.2. *Development of regular national surveys*

Sectoral employment is now based on the *Annual business inquiry*. This was introduced by ONS in 2000 to replace the *Annual employment survey* as well as various other official surveys of indicators of economic activity (including output). The *Annual business inquiry* focuses on sectoral and spatial dimensions. It does not cover occupations or qualifications.

The second main source of labour-market data on employment is the LFS. Until the annual LFS was established, the main source of data on occupational employment in the UK was the decennial *Census of population*. Other surveys conducted by DfEE did contain occupational data but this was not their central purpose and they were inappropriate for many reasons. Perhaps the most problematic feature was the lack of a standard system for classifying occupations. Data sets such as the *New earnings survey*, for example, used a system for classifying occupations which was quite incompatible with the system used in the *Census of population*.

The gradual improvement in the LFS and, in particular, the increase in sample size, mean that it is now the prime source of data on occupations. However, it is still limited in its ability to provide accurate data for small geographical areas, such as those covered by local LSCs. Compared to the huge survey of establishments conducted by the BLS for the US, (which provide a quite accurate and very detailed picture of skill mix within sectors), the LFS provides a rather erratic picture of trends in occupational structure at the two-digit sectoral level.

The government also sponsors many other surveys. In addition to the *Employers skills surveys* discussed in Section 3.6, these include the *New earnings survey* and many more ([21]). The vast improvements in information technologies have resulted in an explosion in the development of databases and primary data collection exercises at local level. Many of these are intended to assess current positions but some also look into the future. These include major *Skills audits* of the population to supplement and update the information from official sources, as well as *Surveys of employers*, intended to assess their skill needs. Most of these have been undertaken at local level by NTOs, SSCs, TECs, LECs, local LSCs, etc. These organisations have generally subcontracted this work to specialist survey companies and labour-market consultancies. Although this increase in availability of relevant LMI is to be applauded, there are many problems related to inconsistencies in methodology and definitions which make it much less useful than it otherwise might be. There is a strong case for a more coordinated approach that gains from economies of scale and benefits from synergy and cross-fertilisation. The SSDA and the national office of the LSC have sought to generate these, notably through the LSC's *National employer skills survey*.

4.2.3. *Electronic access to databases:*

(a) NOMIS: a major development in making LMI more accessible was the introduction of the National online manpower information service (NOMIS) based at Durham University. This national system, funded by the government, is designed to allow analysts direct access, via the Internet, to data sets containing market information. These data sets include the censuses of population, the census of employment (and its successors the *Annual employment survey* and the *Annual business inquiry*), the LFS and various other data sets for which DfES is responsible. The availability of NOMIS has led to a vast expansion of activity related to the processing and dissemination of LMI, including the development of a range of commercial services aimed at providing a forward look at the labour market. NOMIS allows detailed data to be obtained for quite small geographical areas, such as Local Authority Districts (of which there are almost 500). However, there are some limits imposed by DfES because of reasons of confidentiality as well as other constraints imposed by considerations of statistical reliability. ONS has been exploring ways of making such information available to researchers, with safeguards to protect confidentiality. This has also been used as an opportunity to explore ways of linking previously separate data sets under the umbrella of the business data linking unit ([22]).

(b) Economic and Social Research Council survey archive: other data sets, including more complete access to the detailed results from the LFS, have been made available via the survey archive at Essex University. This is a repository for all data sets collected under the auspices of the Economic and Social Research Council, as well as many others. Access is provided for academic and commercial use (the latter incur substantial charges). Commercial access to the LFS is also available through commercial companies such as Quantime.

(c) Census microdata unit: in a similar fashion to the above, the census microdata unit at Manchester University provides more detailed access to the full census of population data

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([21]) For details see Green et al. (2002).

([22]) Business data linking, Office for National Statistics, 1 Drummond Gate, London SW1V 2QQ.

set for 1991. To preserve confidentiality, access is restricted to a sample of anonymised records. A similar procedure applies to the data from the census for 2001, which became available from 2003.

4.3.   Professional weakness in government approaches ([23])

It can be argued (Lindley, 2002) that successive British governments and the civil service have failed to commit themselves to establishing coherent systems that provide both 'current market intelligence' and 'prospective scenarios or projections' on a routine basis. The absence of such systems is characterised by (taken from Lindley, 2002, pp. 139-40):

(a)   lack of commitment to preparing medium and long-term scenarios and keeping them up-to-date;

(b)   lack of capacity within the public service to carry out such work and failure to develop the external capacity;

(c)   loss of critical mass in public service expertise in the field leading to loss of corporate memory;

(d)   lack of understanding of the technical requirements of such work undermining effective subcontracting to external contractors and follow-up exploitation by departmental staff;

(e)   lack of recognition of the need for critical mass and continuity in assessment work on the markets for labour and learning;

(f)   assignment of such intelligence functions to organisations that will not be substantial enough to attract the calibre of staff required to carry them out;

(g)   failure to recognise the standard arguments derived from the economics of information and market failure in favour of public provision of certain types of information;

(h)   resorting to ad hoc studies, commissioned in haste, instead of building routine monitoring, evaluation and projection systems;

(i)   the divorce of evaluation from meta-level modelling and forecasting;

(j)   generating targets without serious analysis of the chances of meeting them, leading to crude forms of 'pressure management' and neglect of the psychology of system reform.

These problems affect virtually all areas of public policy. They are particularly noticeable in the main areas of the public services where the government is the principal employer or dominates completely the financial framework within which recruitment, retention, continuing professional development and retirement take place. For example health, education, and other parts of the public services such as social services, the police, and the armed forces, are all the subject of significant labour-market difficulties which have been inadequately tracked by the corresponding government departments for decades.

([23]) Sections 4.3 and 4.4 draw substantially on Lindley (2002) where the development of the UK system is analysed in more detail and the notion of 'dialogue' is presented and linked to the continuing professional development and 'reflective practice' among those professionally involved in producing and using projections. See Schön (1983) for the original ideas about the role of 'reflective practice' in professional learning and Galloway (2000) for more recent research in the UK context.

Lindley (2002) identifies three key areas of weakness in the approaches taken by successive governments in this area: the divorce of evaluation from forecasting, the lack of central scrutiny of the extent and nature of modelling activity in individual government departments, and failure to think strategically enough about the positioning of analytical functions within complex policy development and delivery structures.

As regards the first of these, the apparent separation of evaluation from forward assessments is evident from *The green book. Appraisal and evaluation in central government* issued by HM Treasury (1997). This makes only limited reference to the need for modelling, simulation (except for Monte Carlo simulation), forecasting and the methodological issues of establishing counter-factuals at the meta or macro levels. Too much *ex ante* and *ex post* evaluation of employment, training and work experience programmes is content to focus at the microlevel. One problem is that while positive impacts of policy emerging from the microdata are necessary conditions, they are not sufficient justification for continuing with the policy even on its present scale and in the same economic circumstances. In fact, it is often the case that policy-makers are contemplating increases in scale through extensions of coverage to other spatial areas, socio-demographic-economic groups, provider/managing organisations, or wider partnership arrangements for delivery. So labour-market assessment work needs to run alongside programme evaluation and re-design.

Turning to the second weakness, relating to modelling *per se,* the report by the Cabinet Office's (2000) performance and innovation unit was concerned with improving analysis and modelling in central government. However, this otherwise promising initiative is limited to showing highly selective good practice in different departments and there is, as yet, no adequate audit of the ways in which each department in turn uses models in carrying out their responsibilities for directing huge sums of public money. In the case of the skills agenda, at a time of major policy debate and reform, no example at all is given relating to modelling the education and training systems or anticipating skill needs.

The third key area where the design and administration of policy in education, training and employment suffers from cultural weaknesses lies in the apparent neglect of strategic thinking about where to position the analytical functions within a very diverse and changing structure of central government departments, public agencies and other partner organisations (see Section 2). Overall, in the past 10 years or so, the DfEE/DfES seems to have lost an important part of its corporate memory where 'labour and learning market' monitoring and projection are concerned. Budget cuts in certain areas of central government, the creation of the LSC, the de-merger of 'education and skills' from 'employment' and the merger of the latter with social security and pensions to form the DWP have been accompanied by a frenetic pace of policy activity at the same time as a loss of experienced middle and senior management.

The creation of the NSTF (2000b, p. 64) did lead to some independent assessment of the (then) DfEE's performance which was seen to have failed to show enough leadership in the development of both policy and the information and research systems required to underpin that process. It is unlikely that the NSTF, if it were still in existence, would be more lenient in reviewing what had happened to the information and research systems under the DfES and its agencies in the following four years.

4.4. Promoting dialogue in producing and using projections

The notion of 'dialogue' has become a particular feature of the IER approach to both producing and using projections (Lindley, 2002), though the commitments of government departments and agencies to facilitating (i.e. funding) it has fluctuated over the past two decades or so. One aspect that has brought the two together has been the growing demand for more detailed sectoral and spatial analyses. This has been driven by an increasing focus on sectoral and local programme delivery and performance targets. Eventually, the capacity of the data to sustain more disaggregation is reached and, at the margins of both statistical reliability and usefulness for policy, producers and users must jointly share the burden of extracting worthwhile insights from whatever projection work is actually possible.

In relation to producing projections, the tendency to 're-invent wheels' at the sectoral or local level arises inevitably when central government or its national agencies do not offer the strategic leadership and technical support needed and fail to insist on maintaining good practice standards based on an understating of previous monitoring and modelling experience. Dare one mention, in this context, the firm convictions of some of those new to making assessments of labour markets and skill needs that the existing standard industrial and occupational classifications are quite inadequate for their sector and must be changed, throwing away years of careful work and painful statistical compromises.

At the same time, while the importance of special factors that make every sector unique and every locality special is inevitably stressed by any given sector or locality, in practice each is never as unique or as special as it claims to be. The reluctance to exploit existing projections before planning new exercises and to recognise the generic nature of many skills problems amounts to a failure to exploit the experience of the economy before investing in new work, tailored to special sectoral or local conditions.

4.4.1. Producing projections: technocratic dialogue

The purpose of 'dialogue' in relation to quantitative projection work needs to be very clear. It is important to distinguish between *presenting* a projection as opposed to tabling it for expert scrutiny. The latter requires participants to be adequately briefed, which is rarely the case, and despite some attempts by DfES to set up such sectoral dialogues on a formal basis they have yet to be established on a firm footing.

The IER's experience has involved exposing its projections to six principal types of audience:

(a) those with macroeconomic expertise,

(b) specialists on particular sectoral product markets,

(c) those whose expertise relates to sectoral labour markets,

(d) those with specialist knowledge about national/sectoral vocational education and training,

(e) experts in certain occupational areas or professions,

(f) regional or local level specialists.

Each group can make a contribution but the harnessing of their insights is another matter. This requires feedback which is structured and strategic. The practical alternative is to allow the projection to stand, subject to modifications that are deemed to be necessary after the producer

of the projections has had time for further reflection, and then use the remaining feedback to help to elaborate the 'plausible range of alternative scenarios' in qualitative terms. This avoids the danger of entering into an iterative sequence which is both time-consuming and confuses responsibilities. Those bodies consulted should not be expected to sign up to a particular projection. 'Ideally, however, they should have coherent alternative stories to tell which can be contrasted with those implied by the projections themselves' (Lindley, 2002).

4.4.2. Using projections: dialogue as 'reflective practice'

Dialogue can also be seen as encouraging analysis and reflection within the policy and practitioner community. Quantitative projections can be a key input into this process but should provide a framework, not a straight jacket. For maximum benefit this process should be a continuing one. Ad hoc, one-off projection activity does not achieve this. Such a process should be carried out on a systematic and formal basis, with consultation and discussion with different groups of local and sectoral actors according to the expertise they can bring to bear to improve the reliability of the projection or to their intended use of the projection so that an effective dialogue about the future labour-market scenario can take place. In modest ways such a dialogue was, indeed, achieved in the early period of IER's projection work in seminars organised under the auspices of the then Manpower Services Commission. During the 1980s and 1990s, however, the opportunities for that kind of dialogue gradually became fewer, perhaps as a result of the government's progressive demotion of the Manpower Services Commission and its successor agencies in a climate which moved against even the quite mild forms of corporatism present in the UK training field.

During the 1990s, dissemination of the findings of the UK medium-term assessment 'directly' relied on the presentation of the results at major conferences of the policy and practitioner communities and the IER's own series of conferences on medium-term labour-market prospects. However, the IER also built up a substantial 'indirect' dissemination through development of the local economy forecasting model in collaboration with Cambridge Econometrics and the resulting software sales and associated research.

At the same time, to tackle the problem of devolving responsibilities for LMI from national to regional level (as in the case of the regional offices of the Employment Service) or local level (as in the case of TECs followed by local LSCs), there needed to be a more broadly-based, better qualified supply of people trained in labour-market analysis. The continuing professional development of staff in the key organisations required more formal provisions for developing such expertise. In 1991, the IER created such a programme (from 2002, entitled the certificate in employment research), which is modular in structure and aimed at those working on skills and employment issues in various national, regional, local and sectoral agencies ([24]).

Finally, the IER has been responsible for coordinating the design and providing the content of various government-sponsored websites, with the aim of making LMI, including labour-market projections, available to a wider audience. This included the now defunct Skillsbase website which

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([24]) See Lindley (2002) for further comment on dialogue in terms of 'reflective practice' and professional development.

sought to make labour-market trends and projections from the *Projections of occupations and qualifications* work programme available to a wide audience, including those in the policy community, employers, trade unions, careers advisers and other practitioners. The *Working futures* material has been made available via the SSDA's website (www.ssda.org.uk/) and in more detail, to a restricted audience, via the LSC's own internal network.

IER has also been instrumental in the development of the government's Worktrain website (www.worktrain.gov.uk) designed to enable people to find jobs, training courses and information on a range of occupations to help them to make informed career choices as well as the national guidance forum (www.guidance-research.org).

5.   Concluding comments

Forecasting the labour market, and in particular the changing pattern of demand for skills, is not just a mix of social science and art; it is also a matter of institutional design. The success of the activity can be as much due to how it is organised as to how it is handled at a technical level.

The institutional framework within which such work is carried out, together with the 'statistical infrastructure' upon which quantitative models are founded, determine the key features of such projections. While there have been many advances in data collection, storage and manipulation in recent years that have revolutionised what is feasible, changing institutional arrangements for the identification of changing skill needs and the delivery of education and training can play an equally import role in shaping what is undertaken. This chapter has reviewed the significance of such changes in the UK over the recent past, focusing on both technical and institutional issues, at a time when there has also been great change in the latter.

Social scientists wanting to model structural change, labour-market behaviour, and learning systems will have ingenious reasons for seeking support for this or that kind of data collection and analysis. Citizens might endorse similar aspirations if they thought that it would lead to a better understanding of employment and learning futures. Structural reforms in the UK have enhanced the contribution that the analysis of skill needs might make to the development of policy in the first place and its delivery in practice. Some agencies have, at the same time, however, focused too much on what is happening at the margins of labour markets and learning markets and too much on the exceptional cases rather than on the situation overall. This is important because, despite the macroeconomic stability and low unemployment achieved in the UK, it is still the case that productivity (output per person-hour) lags considerably behind, in particular, France and Germany.

Generally-speaking, the statistical infrastructure has improved substantially and the capacity to improve on methods of production and presentation has followed suit. There is now considerable scope for improving the technical modelling work which underpins the dialogue activities relating to the understanding and use of projections. However, the institutional context for sustaining the latter dialogue processes still needs much more attention.

This chapter has stressed several points which arise from considering the experience of the UK in anticipating skill needs. They include especially the importance of the:

(a)   institutional framework and the need to pay attention to maintaining 'corporate memory';

(b) the development of classifications of industry and occupation used consistently across all data sets and analyses;

(c) the statistical infrastructure and the need for further improvement;

(d) the development of the notion of 'good practice' in preparing and using projections of skill needs;

(e) the notion of 'dialogue' both in producing and using projections and the need to develop new frameworks to facilitate it;

(f) new opportunities offered by technological innovations in both the production and presentation of judgements about future skill needs;

(g) new priorities for research and primary data collection, but recognising the need to focus on core skill needs not just what is happening at the margins.

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PART II

National systems of
early identification of skill needs
in continental Europe

Frank Cörvers and Maud Hensen
**Forecasting regional labour market developments
by occupation and education**

Marc-Antoine Estrade
**Future prospects for occupations and qualifications in France:
is it possible to coordinate all the players involved?**

Volker Scharlowsky
The system of early identification of skill needs in Germany

Forecasting regional labour market developments by occupation and education ([25])

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The paper presents a model that covers the whole regional labour market with regard to detailed occupational groups and types of education. In drawing up the regional labour-market forecasts an approach was chosen in which the regional forecasts of employment growth per sector of industry, the age composition and the participation rates at regional level and the regional distribution of working youngsters with a particular type of education are important input. The advantages of this approach are consistency of national with regional forecasting of the labour market, and allowance for interaction between different segments of the regional labour market. Another advantage is that in spite of data constraints a fairly high level of disaggregation by occupation and education can be achieved at regional level. However, the regional model hardly deals with changes in the mobility flows of workers between regions. The relevance of these flows is dependent on to what extent labour-market developments in the specific region respond to mismatches between occupation and education (gaps) in other regions. Further research is required to incorporate these adjustment processes into the regional forecasting model.

1.   Introduction

For the Netherlands the Research Centre for Education and the Labour Market (ROA) biennially publishes the report *The labour market by education and occupation to 200x* ([26]), which includes analyses of expected labour-market developments in the light of particular policy issues. Since the matching problems between labour supply and demand can be regional in nature, ROA conducts forecasts for three provinces of the Netherlands (Limburg, Gelderland and Overijssel). The regional labour-market forecasting by occupation and education is based on the methodology used to forecast national labour-market developments. An advantage of this approach is that the forecasts for the regional demand and supply are consistent with the national forecasts.

The general forecasting model for the whole labour market and data from national and regional sources are combined to serve two main functions of labour-market forecasts: policy and information (van Eijs, 1994). The policy function refers to the usefulness of labour-market forecasts for policy-makers at ministries, public employment services and employment agencies, employers' organisations, unions and educational organisations. Expected labour-market developments in broad occupational classes or educational categories can be found in the above-mentioned report. By considering the main future trends of the labour market, policy-

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([25]) This is an extended version of the paper which will be published in the book *A survey of spatial-economic planning models in the Netherlands. Theory, application and evaluation.* Edited by F. van Oort, L. van Wissen and M. Thissen.

([26]) See for example ROA, 1995, 2001, 2003abcd and Cörvers, et al., 2002.

makers can propose required changes in the educational infrastructure, or underpin strategic management decisions on human resource policies. Forecasts at national and regional levels that focus on the macroeconomic or industry level – as usually is the case – do not allow detection of changes in the occupational mix within sectors of industry or the continuous upgrading of the skill level within many occupations. Further, since the forecasting model covers the whole labour market, it can account for interaction between different segments of the labour market. Partial analyses of the labour market often fail to include these interactions ([27]).

Information originally focused on vocational and career guidance. This improves the functioning of the labour market, since individuals are more able to adjust their human capital investment decisions to labour-market prospects of types of education (Borghans, 1993). The National Careers Guidance Information Centre (LDC) ([28]) incorporates ROA's labour-market information in various products for vocational and educational guidance. Firms and labour-market agencies may also use labour-market forecasts as 'early warnings' on future recruitment problems and to outline human resources policies or design training programmes. In other countries comparable occupational forecasts are published, for example, by the Bureau of Labor Statistics in the US and ESRI in Ireland (for a review of OECD countries see Neugart and Schömann, 2002). All these models assume labour-market imbalances exist because of market imperfections. Providing individuals with information about future labour demand and supply developments for different occupational groups and types of education may reduce cobweb-type ups and downs.

Labour-market information for individual purposes usually requires much more detail than that for policy-makers. Therefore labour-market information provides a detailed insight into the current and future labour-market position of 104 types of education and 127 occupational groups. The ROA information system covers the whole spectrum of occupational groups and types of education on the labour market and is designed to cater to both. For consistency between aggregated labour-market information (e.g. employment trends at sector level, increase in the level of education) and detailed information, it is important to use both a fitting general forecasting model and national databases which distinguish between the various occupational groups and types of education.

This chapter deals with the forecasting model of the Dutch labour market and its regions developed by ROA. Section 2 discusses some organisational issues on national and regional labour-market forecasting. Section 3 discusses the basic principles underlying ROA's labour-market forecasting. Subsequently the most important parts of the forecasting model are discussed, i.e. expansion demand, replacement demand, inflow of school-leavers onto the labour market, and the labour-market gap indicator. Section 4 presents regional labour-market forecasts for the province of Gelderland. Section 5 draws some conclusions.

([27]) For example, analysis of the labour market for engineers should include manufacturing industry developments as well as other sectors of industry.

([28]) Available from Internet: www.ldc.nl [cited 27.10.2005].

2. Organising national and regional projects on labour-market forecasting

The national forecasting project in the Netherlands calculates labour-market developments every two years. Forecasts are given for a period of five years. These forecasts are produced for policy-makers in ministries and other governmental, semi-governmental and other organisations involved in labour-market issues and especially in the match between education and the labour market. There is also a digitised dataset available to individuals, such as labour-market data on vocational guidance, training programmes and job search. During the year the forecasts are produced, the forecasting models use new insights into the functioning of the labour market. The models are recalculated using updated input data. Another year is spent on preparing the specific topics presented in the different chapters of the report, evaluating forecasts made in the past, and developing new labour-market indicators and submodels.

The research is carried out by a team of about 10 researchers (about four FTE per year). There is an advisory committee of professional experts headed by an independent chairman (university professor). Financial matters are discussed and negotiated in a committee of financing partners. The project was originally (1985) financed on a five-year basis and then on a three-year basis. Today, the budget and activity plan are negotiated every year, although there is a 'gentleman's agreement' to continue the project for several years to come. The budget is split into two parts: a basic part and a supplementary part consisting of delivering information to specific users. The basic part is financed by the ministries of education and agriculture, the Centre for Work and Income (CWI), National Careers Guidance Information Centre, temporary employment agency (Randstad), and some institutes with specific tasks in education and the labour market. Additional activities are financed by an institute producing and publishing information for students' choices and by the Centre for Work and Income. All labour-market information is available on request. However, to prevent free riding, big clients (e.g. professional or trade organisations, large firms) have to pay for labour-market information to cover extensive research. Small requests for labour-market information from, for example, journalists is provided free of charge.

Organising regional labour-market projects differs somewhat across regions. There always is an advisory committee of local experts, representing (semi-) governmental bodies, schools, trade organisations, employment agencies, etc. When conducting research ROA often works with the research institute of the region in question. At regional level a digitised dataset is available – free of charge – through, for example, the website of a particular province. Provinces in the Netherlands are usually the most important partners to initiate and finance projects on regional labour-market forecasting. However, sometimes the Public Employment Service (CWI) finances them, and in some regions local educational institutions and trade organisations, municipalities and regional platforms for labour-market policy are willing to pay for the forecasting project. The continuity of a labour-market project in a particular region is less guaranteed, and depends on the regional agenda and evolving policy priorities.

3.   Basic principles and structure of the forecasting model (^{29})

In the past, it was thought that coordination of the education system and the labour market could be solved by planning. One well-known approach was the 'manpower requirement model' as applied, for example, by Parnes (1962), who developed a manpower planning model based on the input-output structure of the economy. Various methodological and fundamental objections have been made to this approach. Methodological objections focus particularly on fixed coefficients, used in the forecasting models to translate economic development into changes in employment differentiated by training and occupation, and on its mechanical concept of labour-market functioning, in which there is no place for substitution and other adjustment processes (Blaug, 1967). The fundamental objections are that future developments are not sufficiently predictable, and that an exclusive relationship between job requirements and training is assumed without adequate justification.

These objections and lack of sufficient statistical data for estimating forecasting models, led to rejection of the planning concept. A flexible approach to education was advocated, which would enable an adequate response to uncertain future developments. According to the latter concept, initial training courses should be broadened so each could lead to a broad range of occupations. Any discrepancies between specific and mutable job demands, and qualifications of workers would have to be dealt with by short training courses and on-the-job training.

Further, it was no longer thought that a policy of direct intervention was required to ensure correspondence of the education system to the labour market, but rather that providing adequate information would make the labour market more transparent for those choosing a course of study or others investing in education. This transparency would make the supply of labour more responsive to changes on the labour market. Labour-market forecasts also give firms an indication of future labour recruitment problems for various skill categories, enabling them to anticipate future shortages, and provide internal training and outflow reduction policies for categories of workers for which future shortages are forecast. This development is evident in the completely changed role of manpower forecasting in various countries where occupational and/or educational forecasts are still made (Hughes, 1993; Heijke, 1994; OECD, 1994; Heijke and Borghans, 1998; Neugart and Schömann, 2002).

Several basic principles are considered when compiling these highly differentiated forecasts. These principles counter the more fundamental and methodological criticisms of initial manpower planning approaches and are listed below. The same methodological issues apply to regional forecasting models of labour demand and supply. However, when forecasting regional labour demand and supply some additional issues and constraints are important:

(a)   forecasts are limited to the medium term, a period of five years. In this horizon changes on the labour market are less uncertain than in the long term (^{30}), where uncertain results of substitution, geographical mobility and other adjustment processes can be decisive, in

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(^{29}) Some parts of this section were taken from Cörvers et al. (2002). For the regional dimension of the ROA forecasting model see also Berendsen et al. (1993).

(^{30}) Also pupils and students participating in educational courses with a maximum duration of five years, due to which their inflow onto the labour market in the medium term can be predicted relatively easily (although predictions on drop-outs and flows within the educational system are also important).

particular where discrepancies between demand and supply may be extremely large. On a smaller scale of analysis, for example in the 12 provinces in the Netherlands, the uncertainties are larger due to the great impact of the closure or establishment of a big firm in the region;

(b) instead of fixed coefficients for the occupational and skills structure of employment, explanatory models are used to describe the changes in both structures over time. Some preliminary analyses show that the national occupational and skills structure of employment within sectors of industry is very similar to the employment structure in many regions. Therefore trends in the employment structure within sectors of industry are similar and can be used to forecast regional employment growth. Moreover, differentiation of the regional employment structure by occupation and education is not possible for all labour-market segments due to the relatively small sample sizes at regional level in the labour force survey (LFS);

(c) the theoretical framework, which underlies forecasting models, incorporates both *ex ante* and *ex post* substitution processes in forecasts of labour-market situations for various types of education. Ex ante substitution refers to demand-led substitution between types of education due, for example, to the upgrading of skill requirements for a particular occupation, whereas *ex post* substitution refers to shifts in the educational structure of employment in an occupation as a result of the initial gaps between demand and supply of various types of education (e.g. Borghans and Heijke, 1996; Cörvers and Heijke, 2003). In the regional forecasting model interaction between regional labour markets is (and perhaps more) important, in particular when forecasts are made for administratively-bound areas such as provinces (see Hensen and Cörvers, 2003). This implies that both substitution processes between types of education within regions and changes in commuting (or migration) flows between regions can solve the discrepancies between supply and demand to some extent. However, these adjustments between supply and demand are not costless;

(d) no detailed comparisons of demand and supply are made for each forecasting year, but forecasts themselves are limited to general indicators of the relationship between demand and supply for categories of education over the whole forecast period. Information intended as guidance for students is limited to a qualitative description of the labour-market prospects of these training categories, on a scale from 'good' to 'poor'. This requires education categories to be carefully constructed, so that the variation in labour-market prospects within each category is as small as possible ([31]). At regional and national levels the same classifications by occupation and education and the same characterisations of labour-market prospects are used;

(e) it is important to make as much use as possible of any information on the future growth of employment, flows between work and inactivity, and flows from the education system onto the labour market. In the Netherlands this applies in particular to changes in employment in the various sectors of industry, which are taken from the Netherlands Bureau for Economic Policy Analysis (*Centraal Planbureau,* CPB), and to flows from the education system onto the labour market, which are taken from forecasts made by the Ministry of Education, Culture and Science. By using these, we ensure labour-market

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([31]) For a description of the way in which ROA has defined the types of education that it differentiates, see Heijke et al. (2003).

forecasts are consistent with forecasts that provide the basis for policy decisions on important social and economic issues ([32]);

(f) the uncertainties associated with labour-market forecasts, are to some extent met by mapping the labour-market risks that a particular choice of training may exhibit. Statistical indicators have been developed as a supplement to forecasting the probability of finding an attractive job. The indicators give insight into, for example, the opportunities that a type of education offers for switching occupations, and the sensitivity of the occupations relevant for a particular type of education to cyclical fluctuations (Dekker et al., 1990). Preliminary analyses show these indicators do not differ much between regions;

(g) the national forecasts made are evaluated periodically at the end of the forecasting period (see e.g. Borghans et al., 1994; Smits and Diephuis, 2001). This evaluation includes an empirical evaluation of the forecasts made by all submodels and the resulting labour-market signals provided for students and firms, and a survey of the methodology, describing the strong and weak points of the models and possible improvements and extensions. The regional labour-market forecasts have not been evaluated so far.

Figure 1: The general forecasting model
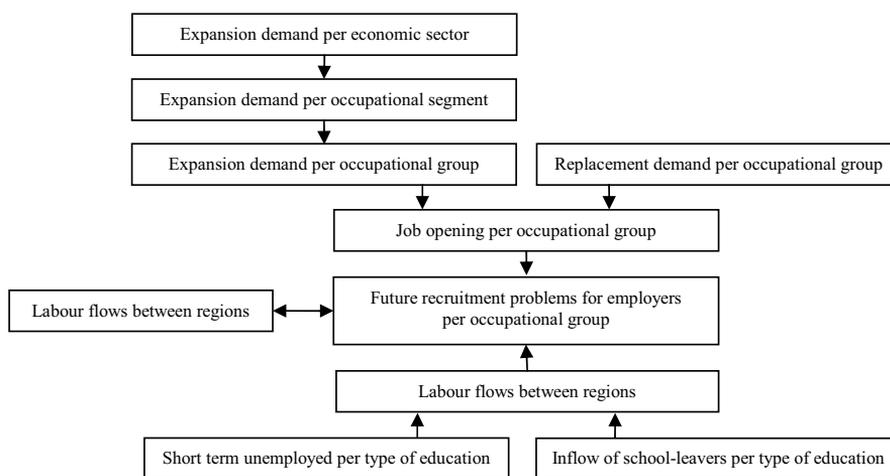
3.1.   Structure of the labour-market forecasting model

Figure 1 gives a general description of flows on the labour market. A distinction is made between demand resulting from future changes in employment levels – expansion demand – and demand due to retirement and occupational mobility – replacement demand. The sum of expansion and replacement demand equals the expected number of job openings. A distinction is also made between supply from the inflow of school-leavers and the short-term unemployed. When looking at expected future labour demand and supply discrepancies on the

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([32]) See Cörvers (2003) for a discussion of this so-called top-down approach.

labour market by occupation or education arise. These discrepancies can be seen through an indicator of the future labour market situation (IFLM), which shows the future labour-market prospects for school-leavers with a particular type of education or the future recruitment problems of employers to find personnel for a particular occupation. In the figure the comparison between demand and supply is presented for occupational groups. Through the IFLM employers can foresee to what extent it will be possible to recruit personnel with the required qualifications for particular occupations.

3.2.   Expansion demand

The national employment projections by sector of industry, based on the Athena model of CPB, are the starting point for the forecasts. The Athena model is a multisector model of the Dutch economy (CPB, 1990), which distinguishes about 15 sectors ([33]). However, CPB does not make regional forecasts of employment growth by sector. Therefore an alternative source of forecasts is required by which national and regional forecasts by sector are compiled according to a similar methodology. The regional forecasts of employment growth by sector are derived from forecasts made by the provinces themselves or other institutes (Ecorys NEI, TNO). However, the national CPB employment forecasts are often used as input when compiling these regional employment forecasts. Considering that particular occupational classes within economic sectors may grow more rapidly than others, we translate the forecasted employment growth of economic sectors into the expansion demand per occupational class (Cörvers et al., 2002; 2004). In turn, the implications of the predicted growth in the various occupational classes for the expansion demand for each type of education are determined. Regional forecasts of expansion demand are determined by using these national forecasts. The expected national changes in the occupational and educational employment structure are projected on the professional and training structure of employment of the region concerned ([34]).

Data on the regional employment structure are drawn from the LFS of Statistics Netherlands. Forecasts are only made for occupational groups or types of education with at least 2 500 persons (average of two years) employed in the region in question. This restriction is set by Statistics Netherlands to prevent publication of figures from the LFS with too broad confidence intervals. Thus, this number can be regarded as the minimum size of occupational groups and types of education for which reliable regional labour-market forecasts can be made.

The model of expansion demand is illustrated in Figure 2. Various shapes have been used for the boxes in Figure 2. A rectangle with rounded corners shows the results (or interim results) from estimating the national forecasting model. Additional data required for forecasting the regional expansion demand are marked by a hexagon. Results of the regional model are shown in a rectangle. Shaded rectangles represent final forecasting results of changes in provincial employment by occupational group and type of education.

([33])   The classification and number of sectors distinguished in the Athena model of CPB varied over time.

([34])   A similar approach was followed for regional occupational forecasts in the UK (Lindley and Wilson, 1991).

Figure 2: Methodology of regional expansion demand

Regional occupational model

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                          ┌──────────────┐
                          │  province X  │
                          │economic sector│
                          │ growth 2003-08│
                          └──────────────┘
                                 │
                                 ▼
  ┌──────────────┐                              ┌──────────────┐
  │  province X  │────────────────────────────▶│  province X  │
  │economic sector│                             │economic sector│
  │ numbers 2003 │        ┌──────────────┐      │ numbers 2008 │
  └──────────────┘        │occupational  │      └──────────────┘
         ▲                │group X        │             │
         │                │economic sector│             │
         │                │ growth 2003-08│             │
  ┌──────────────┐        └──────────────┘      ┌──────────────┐
  │occupational  │◀───────────────────────────▶│occupational  │
  │group X        │              │              │group X        │
  │economic sector│              ▼              │economic sector│
  │ numbers 2003 │                              │ numbers 2008 │
  └──────────────┘                              └──────────────┘
         │                                             │
         ▼                ┌──────────────┐             ▼
  ┌──────────────┐        │  province X  │      ┌──────────────┐
  │  province X  │───────▶│occupational  │◀─────│  province X  │
  │occupational  │        │group          │      │occupational  │
  │group          │        │ growth 2003-08│      │group          │
  │ numbers 2003 │        └──────────────┘      │ numbers 2008 │
  └──────────────┘                              └──────────────┘
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Regional educational model

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                          ┌──────────────┐
                          │occupational  │
                          │group X        │
                          │type of education│
                          │ growth 2003-08│
  ┌──────────────┐        └──────────────┘      ┌──────────────┐
  │occupational  │◀───────────────────────────▶│occupational  │
  │group X        │              │              │group X        │
  │type of education│            ▼              │type of education│
  │ numbers 2003 │                              │ numbers 2008 │
  └──────────────┘                              └──────────────┘
         │                ┌──────────────┐             │
         ▼                │  province X  │             ▼
  ┌──────────────┐        │type of education│    ┌──────────────┐
  │  province X  │───────▶│ growth 2003-08│◀─────│  province X  │
  │type of education│     └──────────────┘      │type of education│
  │ numbers 2003 │                              │ numbers 2008 │
  └──────────────┘                              └──────────────┘
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National employment forecasts per occupational group are derived as follows ([35]). Starting from the CPB forecasts of employment by sector, a two-step model is estimated to explain the occupational structure of sectors. The changes in employment levels per economic sector are first translated into employment changes for 43 occupational segments by using a model with explanatory variables ([36]). Changes in the employment structure are estimated based on the LFS data from 1988-2002. Because the available time series is rather short, a random coefficient model has been used ([37]).

([35]) National forecasts of expansion demand per type of education are not discussed here. The methodology of these forecasts includes shifts in the employment structure of skill categories (upgrading) within an occupational group due to technological and organisational developments, as well as the substitution processes that result from discrepancies between labour demand and supply and cause additional shifts in demand as employers adjust their desires in accordance with the availability of workers (see Borghans and Heijke, 1996; Cörvers and Heijke, 2003).

([36]) In the latest occupational model of expansion demand (Dupuy and Cörvers, 2003) the relevance of explanatory sector variables such as value added, capital investment and R&D expenditure, follows directly from a microeconomic model for the occupational structure of sectors. In this model additional variables of capital-skill and skill-biased technological change are considered.

([37]) Borghans and Heijke (1994) provide a detailed description of this model.

3.3.   Replacement demand

The demand for labour also consists of replacement demand, which arises when workers retire, leave the labour force under an early retirement scheme or due to work disability, withdraw from the labour market temporarily, or switch to another occupation, etc. However, replacement demand only occurs if the departure of an employee actually leads to a vacancy for a new entrant. If the departure of a worker is taken as an opportunity to cut employment levels, no replacement demand results. There is an important difference between replacement demand per occupational class and per type of education, because occupational mobility has an influence on replacement demand per occupational class, but not on replacement demand per type of education. Switching occupations has no effect on the educational structure of employment. On the other hand, when workers complete part-time studies for a higher level or a different qualification, it produces an outflow of workers to another educational category (type of education). In this case replacement demand arises in the educational category under which the worker's previous education was counted.

The first step in modelling future replacement demand per occupational group ([38]) is to describe inflow and outflow patterns by occupational group over a historical period. Because there are no appropriate data for mobility flows on the labour market, stock data are used. By using the cohort components method cohort-change rates based on the number of persons of the same birth cohort who were employed at two different times are calculated (Shryock and Siegel, 1980).

The second step is to translate these inflow and outflow percentages into replacement demand by occupational group. For occupational groups with an increase in employment in the period (t-1,t), replacement demand is equal to total net outflow during this period. However, for occupational groups which faced a decrease in employment, not all vacancies due to the outflow of workers will have been filled. Therefore, replacement demand for these occupational groups equals the number of vacancies that were actually refilled, that is, the total inflow of workers in the occupational group. A random coefficient model is estimated in which the net inflow or outflow ratios are explained based on the average inflow or outflow from the total working population on the one hand and the occupation-specific deviations per age-gender group on the other (Willems, 1999). This approach guarantees that the sum of the net flows among occupations corresponds to the total inflow or outflow.

The third step is to project the historically measured net replacement demand rates per age-gender group for a particular occupational group onto the age-gender structure of workers at the beginning of the forecasting period. Further, the historically observed cohort change rates are corrected for business cycle effects and for expected changes in participation rates (for more details see Willems and de Grip, 1993). Future replacement demand is determined in the same way as historical replacement demand. For occupational groups with an expected increase in employment, replacement demand equals net outflow. For occupational groups for which a decrease in employment is expected, replacement demand is equal to the total net inflow.

The replacement demand for Gelderland (Section 4) is derived by using the official sources of the province of Gelderland on the structure of the labour force by gender and age. Corrections

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([38])   A similar method is used to determine the replacement demand per type of education.

for changes in the participation rate are determined by using these regional data as well. To forecast replacement demand the same inflow and outflow rates are used (by gender and age class, and by occupation and education) as those estimated for the Netherlands. It is assumed these rates do not differ much between regions, since, for example, retirement schemes for sectors of industry or occupations are often settled at national level. Further, the occupational structure of the working population is drawn from the LFS. A RAS procedure ([39]) is used to estimate the matrix of occupation by age-gender group. Total regional replacement demand per occupational group can be derived by projecting the corrected net inflow and outflow ratios on this matrix.

3.4. Inflow of school-leavers onto the labour market

Forecasts of the flows of school-leavers entering the labour market match the *Referentieramingen* (Reference forecasts, OCW, 2001) compiled by the Ministry of Education, Culture and Science for courses in the 'regular' (full-time initial) education system. ROA disaggregates these forecasts by using supplementary data from education matrices of Statistics Netherlands and its own school-leavers information. Supplementary data from Statistics Netherlands are also used to estimate the effects of further (vocational) education on the flows entering the labour market. Besides those leaving school with a qualification, the reference forecasts cover students who end their studies without a certificate. With the help of education matrices, these school-leavers can be reassigned to any preliminary course from which they have obtained a certificate.

A forecast is also made of the flow from post-initial training onto the labour market. This flow indicates the effects of lifelong learning on the educational structure of labour supply. Data on the inflow of 'newcomers' to the labour market from post-initial training are derived from the LFS. Due to data restriction it is assumed that in the forecasting period the proportion of workers with a particular educational background that completes a post-initial training course giving them another educational background is the same as in the latest year for which data on the participation in post-initial training are available.

The national inflow of school-leavers with a particular type of education onto the labour market is distributed over the regions by the shares of working youngsters (until 30 years old) living in the different regions (provinces of the Netherlands). By implicitly allowing for historical migration flows of young workers between regions, we are able to forecast the inflow of school-leavers onto the regional labour market. However, gaps between supply and demand in particular labour segments within regions may change the direction of these migration flows.

3.5. Labour market gap indicator

By matching labour demand with supply, an IFLM situation can be constructed. This indicator of labour-market prospects is constructed for each occupational group and type of education. If the indicator of the future labour-market recruitment problems for employers has the value of 1, employers are not constrained by limited supply of particular types of education in their recruitment policy. The indicator represents the extent to which labour supply meets demand

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([39]) RAS procedure is a biproportional method of a matrix adjustment where R = row-adjustment factors, A = input-output matrix, and S = column-adjustment factors.

per occupational group. In particular, the indicator measures the chances employers have to achieve the desired educational composition of the workforce within occupational groups at the end of the forecasting period (Cörvers et al., 2004). The smaller the indicator is, the larger the recruitment problems for employers. The indicator of the future labour-market situation is translated into a 'qualitative characterisation' of expected future recruitment problems for employers on a five-point scale: none, almost none, some, serious and very serious. Such a qualitative characterisation in quite broad terms suffices for various purposes, including recruitment policies, labour-market exchange, training policies, and vocational counselling and career guidance. Further, it prevents much significance being attached to the exact numbers of shortages or surpluses.

The forecasts and the labour-market gap indicator (IFLM) give an indication of the direction of the change in labour flows between regions required to smooth discrepancies between labour demand and supply. Although potential changes in inter-regional mobility flows are not considered in the basic regional labour-market model, these changes may be important as a labour-market adjustment mechanism. However, local labour markets may be isolated by infrastructural barriers that prevent the free movement of labour between regions. Shortages of specific types of workers in a local labour market can persist if these barriers are too high.

4.   Application of the regional labour-market forecasting model

This section will present the forecasting results for the province of Gelderland, one of the 12 provinces of the Netherlands. Gelderland is situated in the middle and eastern part of the Netherlands, between the province of Utrecht and Germany. The capital city is Arnhem and other important cities are Nijmegen and Apeldoorn. The labour force of Gelderland consists of about 845 000 workers, 12 % of the Dutch working population. Relative to the Netherlands, many people in Gelderland work in the food and beverage industry, metal and electronics, rubber and plastics and construction. Relatively few are employed in energy, chemicals and transport, storage and communication.

4.1.   Forecasting results for the province of Gelderland

In Table 1 the forecasting results of 11 occupational classes are presented for the period between 2003 and 2008 (ROA, 2004). These 11 occupational classes are aggregates of 127 occupational groups, for which the most detailed forecasts are available. The classification of occupational groups is based on the three-digit international standard classification of occupations (ISCO). Forecasts may vary significantly for different occupational groups within one occupational class, in particular between occupational groups with high job levels and those with low job levels.

The total percentage of job openings during the five-year period from 2003 to 2008 is expected to be 20 % of the total number of employed in 2002. Note that total replacement demand is much larger than total expansion demand ([40]). The largest number of job openings

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([40])   The outflow of workers from a particular occupational group only contributes to the number of job openings when these workers are really replaced. Thus, the replacement demand model accounts for the foregone job

as a percentage of occupational employment in 2002 can be found in public security and safety, education and the cultural occupations (e.g. interpreters, library assistants, artists, clergymen and journalists). The last two occupational classes also exhibit the largest replacement demand. On the contrary, very low replacement demand is expected for ICT occupations. These differences in replacement demand are to an important extent related to differences in age composition between occupations. The strongly growing employment in ICT occupations has attracted many young people. For these occupations expansion demand is still expected to be the largest of all occupational classes. Employment in agricultural occupations is expected to decrease further during the coming years. For technical and industrial occupations, transport, sociocultural occupations (e.g. personnel officers, personnel managers, welfare workers, researchers) and commercial and administrative occupations, expansion demand is also expected to be negative.

The mismatch between labour supply and demand is indicated by the IFLM. As discussed before, the indicator has the maximum value of 1 if employers are not constrained by limited supply of school-leavers for particular types of education. The smaller the indicator is, the bigger the recruitment problems. From Table 1 it follows that employers searching for graduates qualified to work as teachers in the educational sector will be confronted with very serious recruitment problems. The number of job openings, mainly caused by replacement demand, cannot be easily refilled, as the inflow of school-leavers into educational occupations is too low. Despite the relatively large number of job openings in the public security and safety occupations, the inflow of school-leavers is large enough to prevent serious recruitment problems for employers. However, employers may expect serious recruitment problems in cultural, technical and industrial occupations. For the public security and safety occupations the number of job openings as a percentage of occupational employments is relatively large, whereas for the sociocultural, technical and industrial occupations this percentage is on average. Recruitment problems in the technical and industrial occupations in Gelderland are mainly due to the relatively low inflow of technically educated school-leavers onto the labour market. These recruitment problems are on average much larger than in other parts of the Netherlands. On the contrary, recruitment problems for sociocultural occupations are much smaller in Gelderland than elsewhere in the Netherlands.

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openings due to an expected employment decline. Therefore, in our model negative expansion demand does not reduce the number of job openings (Cörvers et al., 2004). As a result the number of job openings only equals the sum of expansion and replacement demand for a particular occupational class if expansion demand is positive for all occupational groups within that class.

Table 1: Expected future expansion demand, replacement demand, job openings, and IFLM situation per occupational class for employers in 2008, as percentage of occupational employment in 2002

Occupational class	Expansion demand % Gelderland	Replacement demand % Gelderland	Job openings % Gelderland	IFLM Gelderland	Characteristic of expected recruitment problems in 2008	
					Gelderland	Netherlands
Educational occupations	10	21	32	0.89	Very serious	Serious
Cultural occupations	9	18	28	0.90	Serious	Some
Agricultural occupations	-8	18	18	0.96	Almost none	None
Technical and industrial occupations	-3	18	20	0.91	Serious	Almost none
Transport occupations	-3	13	15	0.96	Almost none	None
Medical and paramedical occupations	5	17	23	0.92	Some	Serious
Commercial and admin. occupations	0	14	16	0.95	Almost none	Some
ICT occupations	11	9	21	0.93	Some	Some
Sociocultural occupations	-1	15	18	0.95	Almost none	Serious
Care and service occupations	6	16	23	0.97	Almost none	None
Public security and safety occupations	7	25	34	0.92	Some	Serious
Total	1	16	20			

Source: ROA/Province of Gelderland/CPB.

4.2.   Commuting flows and the inflow of school-leavers onto the regional labour market

One way to reduce the mismatch between demand and supply in Gelderland is by changing the commuting and migration flows. The supply of labour from other (neighbouring) regional labour markets with fewer mismatches could reduce the mismatches for specific occupational groups in Gelderland, for example in technical and industrial occupations mentioned above. Table 2 gives an impression of the changes in commuting flows and flows of school-leavers onto the regional labour market that are required to bridge the gap between labour supply and demand for the 11 occupational classes. The table shows that to solve shortages in educational occupations in Gelderland, incoming commuting flows should increase by about 170 %. This is not very realistic, particularly since employers are expected to have serious recruitment problems in other parts of the Netherlands. However, for the technical and industry occupations an increase in the incoming commuting flow by only 1 % would meet the expected excess demand. Further,

a decrease of incoming commuters in sociocultural occupations by 14 % would contribute to solving the expected serious recruitment problems in other parts of the Netherlands.

Changes in the inflow of school-leavers onto the labour market could also reduce the mismatches between supply and demand on the regional labour market. School-leavers may choose to work in other occupations as school-leavers of earlier cohorts used to do, or may decide to work (and live) in other regions with better labour-market prospects. The last column of Table 2 shows that the required changes in the inflow of school-leavers are smaller than the required changes in incoming commuting flows for some occupations. For cultural occupations an increase in the inflow of school-leavers from other regions by 22 % would solve the recruitment problems of employers in this occupational class, while commuting flows should increase by 40 % to get the same result.

Table 2: Changes in commuting flows (average 2000-01) required to solve discrepancies between demand and supply per occupational class, as a percentage of the forecast excess demand (2003-08) per occupational class, Gelderland

%

Occupational class	Required change	
	Incoming commuters	Inflow of school-leavers
Educational	172	169
Cultural	40	22
Agricultural	-16	-3
Technical and industrial	1	1
Transport	n.a.	n.a.
Medical and paramedical	n.a.	n.a.
Commercial and administration	-48	-26
ICT	41	42
Sociocultural	-14	-9
Care and service	29	10
Public security and safety	58	123

n.a.:   Not available due to too small numbers.
Source: ROA

5.   Final remarks

The contribution has discussed the labour market forecasting model developed by ROA, which goes beyond the scope of the traditional manpower requirements approach. The model predicts mismatches between labour supply and demand at regional level in the medium term. The model covers the whole regional labour market for detailed occupational groups and types of education. In drawing up regional labour market forecasts an approach was chosen in which regional forecasts of employment growth per sector of industry, the age composition and participation rates at regional level and the regional distribution of working youngsters with a particular type of education are important input. The advantages of this approach are consistency between national and regional forecasting of the labour market, and interaction between different

segments of the regional labour market. Another advantage is, in spite of data constraints, a fairly high level of disaggregation by occupation, and education can be achieved at regional level. Therefore, forecasts by occupation and education can be useful for both policy-makers, who may use regional forecasts at a more aggregate level, employers who may be interested in the future labour-market situation of particular occupational groups, and schools or youngsters who may want to know the labour-market prospects for particular types of education.

Nevertheless, the region-specific dimensions in the labour market forecasting model of provinces are limited, as forecasting draws heavily on national employment trends by occupation and education, and on national flow ratios of workers in and out of the labour force. We expect that trends in the occupational and skill mix within sectors of industry, such as an increase in white collar at the expense of blue collar jobs, and upgrading skills, do not differ much between similar sectors across regions. Moreover, in- and outflow ratios per age class and gender due to, for example, retirement, parenthood or job mobility are not expected to differ much for similar occupational groups across regions.

Finally, the regional model hardly deals with changes in the geographical mobility of workers that result from regional mismatches between demand and supply on the labour market of the province concerned or of neighbouring regions. The relevance of these mobility flows depends on whether similar labour market segments of neighbouring provinces are interrelated, and thus to what extent labour-market developments in a specific region respond to mismatches between occupation and education (gaps) in other regions. Further research is required to incorporate these adjustment processes into the regional forecasting model.

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Future prospects for occupations and qualifications in France: is it possible to coordinate all the players involved?

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Much work has been done in France at national, sectoral and regional levels on early identification of skill needs, focusing on either training needs or labour-market analysis and aiming to anticipate needs in either the short term or the medium to long term.

Almost all these studies have been carried out by bodies close to the areas where decisions are made, and they have usually involved players in the vocational training sphere. However, it is difficult to make training bodies cooperate among themselves. One problem is, there is nobody responsible for cross-disciplinary occupations and skills.

The State Planning Commission, in cooperation with the Ministries of Labour and Education, is currently working on new quantitative projections of labour supply and demand by occupations over the next 10 years. The main value of these projections lies not in the actual data but in the way in which they are built up by large-scale consultation. This may make it possible to develop a body of knowledge and a language common to all the players involved.

1. Main economic and demographic trends: what are the issues involved in studying the future prospects of occupations and skills?

1.1. Retirement

The key issue for retirement prospects is the large number of people born in the immediate post-war period will soon reach the age of 60. This trend is not unique to France, but the impact on retirement will be particularly marked because of the differing sizes of generations (Figure 1).

Figure 1: Numbers of people by date of birth
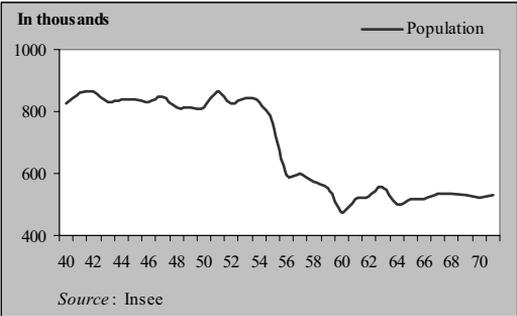
The average size of generations changes from 500 000 per year for those born before 1945 to almost 800 000 for subsequent generations. When these large populations reach retirement age, there will be a 50 % increase in the number of retirements.

The foreseeable postponement of retirement age in accordance with the Law of July 2003 will not essentially change this state of affairs. The average retirement age is currently relatively low, at around 58. The 2003 reform is likely to lead to an increase of one to one and a half years in this age over the next 15 years. This trend may make it possible to smooth out the retirement figures, but there will still be a major increase in the numbers retiring.

Not all occupations will be affected in the same way. Employees in certain occupations are traditionally relatively old. A sizeable proportion of workers aged over 50 are also found in some occupations for historical reasons, for example because of the major campaigns to recruit teachers in the early 1970s, or policy on promotion to management positions in banking and insurance.

Table 1: Examples of occupations in which workers are aged 50 or over

Examples of occupations in which 30 % or more of workers are aged 50 or over	- managers in banking and insurance and the civil service - managers in the public building and works sector and in industry, teachers - company directors, farmers, doctors - domestic workers, child minders - C category workers in the civil service
Examples of occupations in which under 15 % of workers are aged 50 or over	- unskilled workers in packing, finishing, mechanics - electricity supply and processing industries - hotel, café and restaurant workers, cashiers, book-keepers - computer operators, social workers and professionals responsible for cultural initiatives

Source: INSEE-DARES

On the contrary, the age structure of some occupations is young, such as bar workers and cashiers – enterprises usually hire young people for these jobs, but they leave after a few years.

One of the issues involved in assessing the prospects for occupations and qualifications is to estimate the needs for replacement that will arise from these retirements, as part of a more global analysis of trends in supply and demand.

1.2.   The role of training in the labour market

The situation in France is characterised by the substantial impact of internal markets. In recent years, length of service in companies has remained stable or even risen for the most highly skilled employees. A consequence of these internal markets is that initial and formal training plays a very small part in access to the various occupations. Depending on the criteria adopted, between one third and half of employees have actually been trained for their occupation. Employees' skills, including new technologies, have been acquired on the job rather than through continuing training.

Though the way in which knowledge is acquired does not seem to make much difference, this is not true for initial training. Access to and retention of employment continue to depend on qualification levels. Almost 60 000 young people leave the education system without a

qualification (ISCED 1-2), which is 8 % of the 750 000 young people who come onto the labour market each year. Their unemployment rate three years after completing their studies is 30 %, as against 13 % for young people with a vocational qualification (Céreq, 2003).

In a situation where the average unemployment rate has remained higher than 8 % for more than 20 years, the share of low-qualified people in persisting unemployment must also be emphasised.

1.3. Polarisation of demand

In the next few years, demand for labour is likely to become polarised, with highly skilled jobs, such as trainers, computer and R&D engineers, and jobs in communications on the one hand, and low-skilled jobs such as looking after children and the elderly, and catering (Commissariat Général du Plan, 2002) on the other.

Given the high level of unemployment among low-qualified, it may be possible to meet the demand for low-skilled jobs – even if there are already problems in recruiting people for certain jobs in the service industries, such as catering workers, owing to poor working conditions and low wages.

The main problems will probably lie with highly skilled jobs. Enterprises may experience bottlenecks unless they change their recruitment policy.

2. Users of research results in identifying skill needs: what are their needs?

The main users of this research are players involved in vocational training. In terms of expenditure, vocational training represents around EUR 22 billion ([41]), or some 1.5 % of GDP. Enterprises (and sectors) account for 60 % of this expenditure (EUR 13 billion) and the regions for EUR 5 billion, with the remainder being spent by the State and the Public Employment Service (PES).

2.1. Enterprises

Enterprises have a statutory responsibility for continuing training of their employees. Firms with 10 or more employees must spend at least 1.6 % of their wage bill on training. This means they need to be aware of the probable skills trend among their employees, if only to know the direction their training expenditure should take.

But companies also need more general information. Most enterprises are still unaware of the recruitment problems they are likely to encounter when replacing workers who are retiring.

2.2. Sectors

Between 90 and 95 % of employees are covered by a sectoral collective agreement. This means that in each sector, employers and trade unions meet regularly to negotiate wages and

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([41]) Household expenditure on training is not included in this total.

salaries as well as many other issues, particularly on questions of recognising qualifications and implementing vocational training.

Further, a major share of enterprises' expenditure on training is placed in a sectoral mutual fund with equal representation of both sides of social partners. This fund makes it easier to set up intercompany training sessions.

Finally, in accordance with the Law of May 2004, all sectors must establish forecasting observatories for occupations and qualifications (Section 3.1.2).

2.3.   Regions

Laws on decentralisation have given regional councils, i.e. elected regional assemblies, many powers. Among other things, these new powers make it necessary for regional councils to conduct studies to enable them to identify future skill needs.

These regional councils finance some vocational training measures, in particular apprenticeships and adult training.

Regional councils also have an important coordination function – they must draw up a regular regional training development plan, in which each of the players involved in both initial and vocational training commits itself to specific action to be taken in the immediate future.

Lastly, regional councils are responsible for economic development – in other words, for action to be taken to develop a specific sector in the region.

2.4.   The Public Employment Service (PES)

The PES needs to identify skills on a relatively short-term basis, to match better labour supply and demand. It seeks to detect the occupations and skills in demand by enterprises, and also to determine what skills are on offer and what kind of training is needed by the unemployed.

In the framework of various campaigns launched in recent years, the PES will now work closely with various local players, to avert potential recruitment problems.

3.   The various levels involved in identifying future skill needs

3.1.   Sectoral level

3.1.1.   Forecasting study contracts (CEPs)

Since 1988, the Ministry of Labour has supported sectoral studies. The decision to carry out a study is taken jointly by the government and the social partners in the sector, and the studies themselves are also jointly funded.

These studies seek to identify economic, technological and social changes in a sector and to examine the consequences of these changes for job content, organisation and qualifications. They also make it possible to determine initial or continuing training needs. This last point

often takes the form of a contract between the State and the sector, to specify the commitments of both parties to the training plan.

The studies, which are often entrusted to private consultants, do not follow a single model. Depending on the subject they combine to varying degrees elements of quantitative projections and qualitative surveys of companies or employees. Between 60 and 70 CEPs have been published since 1988 ([42]).

The CEP scheme is now diversifying. In future, the tool will have to address how to anticipate and support trends in employment, skills and qualifications and how to keep the most vulnerable workers from failing to adapt to employment trends, by considering the nature of the jobs and the qualification level. From now on the tool will consider local conditions, especially by involving regional councils in financing and managing certain local sectoral studies (see also Guégnard's contribution in this volume).

3.1.2. *Forecasting observatories for occupations and qualifications*

The May 2004 Law on vocational training, which follows on from an interoccupational agreement concluded in October 2003, makes it compulsory for all sectors to establish forecasting observatories for occupations and qualifications.

Certain observatories (construction, car repair, insurance, etc.) were already in place well before this law was adopted. Some are organised into networks of regional observatories, thus gaining an in-depth understanding of trends in their occupations and sectors.

At present, only about 15 observatories are in place. A State Planning Commission working party is seeking to help these observatories, as well as those wishing to get organised and share their experiences (Commissariat Général du Plan, 2004).

These experiences already include several missions common to all observatories:

(a) identifying, compiling and analysing employment/training data to provide more knowledge of the existing situation;

(b) analysing and anticipating the impact of economic, technological, regulatory and demographic trends on employment, occupations and training needs;

(c) disseminating data to the sector's players and the social partners – State/regions, employers' federations and trade unions, etc.

In institutional terms, the position of observatories varies widely from sector to sector. In some cases their research is also used to specify strategy and measures for the sector. In others, observatory research predates policy decisions taken by the sectoral social partners.

([42]) Some of the published CEPs are available on the Internet: http://195.46.219.20/cgp/accueil.htm [cited 21.11.2005].

3.2. Regional level

Since 1989, every region has had a regional employment/training observatory (OREF). Jointly financed by the State and the regional council, its roles include promoting access to information on vocational training and helping to make training provision coherent. Essentially, they are tools for assisting decision-making. These observatories are usually responsible for coordinating the players involved in training to draw up regional training development plans (see Section 2.3).

There is a national network that endeavours to bring all the OREFs together to ensure at least some coherence in their analyses. In practice, however, there are major differences between the regions. In some, the OREF and other players (PES, regional offices of the Ministries of Labour and Education, the social partners, etc.) have succeeded in establishing networks that allow wide-ranging and well-coordinated research. In other cases, none of the players seem to have succeeded in taking over coordination of the various studies. For more details of the process of implementing regional research, see Guégnard's contribution in this volume.

3.3. Creating certifications and vocational qualifications

Creating a new qualification or vocational certification frequently gives rise to preparatory research, to examine the skill and training needs of a given occupation in advance. After scrutiny by the Ministry of Education, the value of these new qualifications is recognised nationally.

The preparatory research is carried out at the request of the sectors concerned or AFPA (*Association Nationale pour la Formation Professionnelle des Adultes* [National Association for Vocational Training of Adults]). All research and the descriptions of qualifications and vocational certificates are compiled in a national list of vocational certifications (RNCP – *Répertoire National des Certifications Professionnelles*), which is available online (www.cncp.gouv.fr).

This essentially qualitative research is based on in-depth analysis of the content and work organisation of the occupation for which the qualification is intended. It seeks to determine the skills required and the way in which they could develop. It then derives from this the possible content of the training required. Thus, this method makes it possible to develop occupational profiles based on the needs of enterprises and sectors.

This idea was taken up by a European project on joint VET qualifications (www.trainingvillage .gr/etv/Projects_Networks/Ccprojects). This project, launched under France's presidency of the EU in 2000, aims to develop a common method for defining vocational qualifications and certificates at European level.

3.4. National macroeconomic approach to the future prospects for occupations and qualifications

There are two lines of macroeconomic projections for occupations and qualifications: first undertaken under the auspices of the Ministry of Education, and second, by the State Planning Commission.

3.4.1. Research by the Ministry of Education on the prospects for employment/training

After centralised planning of training needs was abandoned in the mid-1970s, the Ministry of Education felt a need to recreate a tool to help define the education system in the medium term.

Research was therefore resumed in the late 1980s and entrusted to a private consultant (BIPE). The studies were published and widely disseminated, the first in 1988 and the last in 2004 ([43]) (MEN, 2004).

In methodological terms, these studies are based on four main stages:

(a) a macroeconomic forecast of growth and employment over the next 10 years, with aggregates broken down by main sectors;

(b) a projection of demand by occupational group (the qualification level of the job x the sector);

(c) components of demand for labour by occupational groups are then examined, and hypotheses drawn up on retirement figures, labour-market mobility, and enterprises' recruitment behaviour (internal mobility, hiring of the unemployed, recruitment of young people leaving the education system);

(d) lastly, the needs for recruiting young people entering the labour market by occupational groups broken down by level of education.

These stages are broken down in accordance with different variants (weak or strong growth, preference for recruiting young people or experienced workers, etc.).

3.4.2. Reports on the future prospects for occupations and qualifications

The State Planning Commission is an interministerial body whose current role is to conduct research forecasts based on forecasts shared not only with various ministries, but also with the social partners and all players involved.

In 1999, the Commission decided to have a new series of projections on demand and supply by occupation carried out by the Ministry of Labour. These projections were published in 2002. They are currently being updated; the new projections, looking ahead to 2015, are likely to be published in 2006.

The method used is quite similar to that of the Ministry of Education, and further, the results of two projections are compared and commented on in the reports. However, there are substantial differences in the objectives and in the way in which they are designed.

3.4.3. Shared prognosis and methods

The Commission does not consider the quantitative elements produced to be of interest in themselves, but they serve as a basis for discussion on the methods and results. A large-scale meeting is organised every six months, bringing together the main ministries (Education, Labour, Industry, Finance), the PES, the social partners, and regional representatives. Its purpose is to present the various studies and to validate hypotheses.

([43]) For a summary in English, see www.education.gouv.fr/strateval/revue/revue68/11 [cited: 21.11.2005].

Further, the specific group for sectoral observatories (see Section 3.1.2.) means that the Commission has access to a network in which it can develop and validate its sectoral hypotheses. The sometimes highly qualitative information collected by the sectoral observatories ensures that results are pertinent to national results. Similar work on a regional basis is due to be put in place in early 2005.

3.5.   National guidelines to enable the players to define their own policies

The Commission's projections are of an *ex ante* type, in other words they put forward the risks of imbalances, while at the same time showing the players the levers they can use to anticipate these imbalances. Accordingly projections relate only to occupations and not to training needs, since training is only one of the means available to players.

3.6.   A federative statistical tool – nomenclature of families of occupations

All forecasts were made using a specific nomenclature of families of occupations. This nomenclature is relatively detailed (84 occupations), and administered by the Ministry of Labour. It makes it possible to obtain statistical data on the labour market: what occupations are job-seekers looking for, and what occupations do employers need to fill? Data on employment can also be obtained – on how many employees work in a particular occupation, what the age structure is in this occupation, what retirement flows will be like, what other occupation employees followed before working in this one, what training they have had, etc.

This means that short-term data on labour-market tensions and medium-term forecasting data can be studied together. It also makes available a wealth of statistical data, not only at national level, but also at regional or sectoral levels. Thus research institutions should be encouraged to use this tool, to make it possible to establish a joint 'diagnosis'.

3.7.   A policy of communication

At the time of their publication in 2002, results were presented at some 100 conferences all over France, to various audiences of experts or politicians (regional councils, PES, sectors, etc.). This policy of dissemination was supplemented by making the information available to individuals in a special issue of an economic journal (Alternatives Économiques, 2004), which was distributed in educational establishments through careers guidance officers, and was also widely sold to the general public.

Finally, a website ([44]) was set up to bring together the various available studies and data. This site also provides links to other databases based on occupations (Ministry of Labour) or sectors (Céreq).

([44]) The site has not yet been brought completely up to date, but the interim URL is: http://195.46.219.20/cgp/ accueil.htm [cited: 21.11.2005].

4. Main issues and problems encountered by research to identify skills

4.1. Research essentially geared to training needs

Most studies described in this document originate from players involved in vocational training. Consequently their action plans are usually broken down into training needs. Yet the gap between training and the actual entrance to an occupation should lead to recommendations that go beyond training alone and deal generally with work organisation.

Lifelong learning makes it necessary to reposition training inside the more general issues of change in job management and work organisation. We should be looking at training practices that link training and human resource management in a way that favours corporate performance, while at the same time safeguarding individual career paths and increasing personal control over careers by improving mobility.

4.2. To be useful, forecasting studies must focus on the long term

A qualitative survey was conducted by the sectoral observatories to determine the conditions for implementing their studies in early identification of skill needs. Three conditions appear to be necessary:

(a) quantitative and qualitative information must be regularly made available to companies and sectoral representatives;

(b) those responsible must be involved before research begins, in specifying priorities and hypotheses;

(c) long-term cooperation between researchers and sectoral representatives is necessary.

But this long-term cooperation requires both resources (human and financial) and political commitment from the players (regions and sectors). Research bodies that do not (or do not always) possess these resources cannot effectively shed light on the players' decision-making.

4.3. Who should be responsible for the issues involved in cross-disciplinary occupations and jobs?

Despite the large number of players involved in identifying skills, little consideration is given to certain cross-disciplinary occupations or skills in forecasting research. Some studies have been published (CEP on secretaries, IT manager in sectors outside IT, for example), but they have not been taken further in policy or operational terms. This is a major problem, since identifying and recognising cross-disciplinary skills is key in promoting intersectoral mobility for workers.

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The system of early identification of skill needs in Germany

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The German 'dual' system provides a better understanding for young people of workplace requirements after completion of education. Employers, however, do not provide enough training places in companies. In the face of accelerated changes, in 1999 the federal government and the social partners in the Alliance for jobs, training and competitiveness passed a resolution to improve the early identification of new skill and qualification needs. The contribution explains the system of early identification of qualification needs at federal, sectoral, regional and local levels. The system combines different methods and approaches giving preference to shorter-term qualitative knowledge of specific developments and changes in requirements on the labour market. The system brings together various organisations, institutions and networks, and the social partners have a considerable role to play. The transfer of knowledge on changing skill needs into concrete qualification requirements is considered a focal point of the implementation phase in the system.

1. The German 'dual' system of initial vocational education and training

In most European countries vocational education and training systems are dominated by full-time vocational schools. In contrast, in Germany about 60 % of young people of the same age are trained within the so-called 'dual' system of initial vocational education and training. Participants of all training years together number about 1.7 million young people. The term 'dual' means that part-time vocational school and company complement each other. In part, young people learn their future occupations in practice at their training companies. At the same time, this occupational practice is supplemented by the training part of the vocational school (Figure 1). It has the function of imparting the necessary theoretical knowledge. Thus, after vocational training, young people already know the requirements of a workplace from their own occupational experience. This is one reason why people who complete dual vocational training rather than a pure full-time school training of the same level, find it easier to find a job in Germany.

In Germany, youth unemployment after completion of training is considerably lower than in other European countries. This speaks for the quality and suitability of the dual training approach. Nevertheless, German employers do not provide enough training places within the dual system.

The German Confederation of Trade Unions and the DGB trade unions made proposals asking for a financial contribution from all companies not willing to provide training places (*Ausbildungsplatz-Umlagefinanzierung*). Employers refused and now it is the employers' turn to prove they are able to cope with the training crisis on their own.

Figure 1: Germany's dual VET system
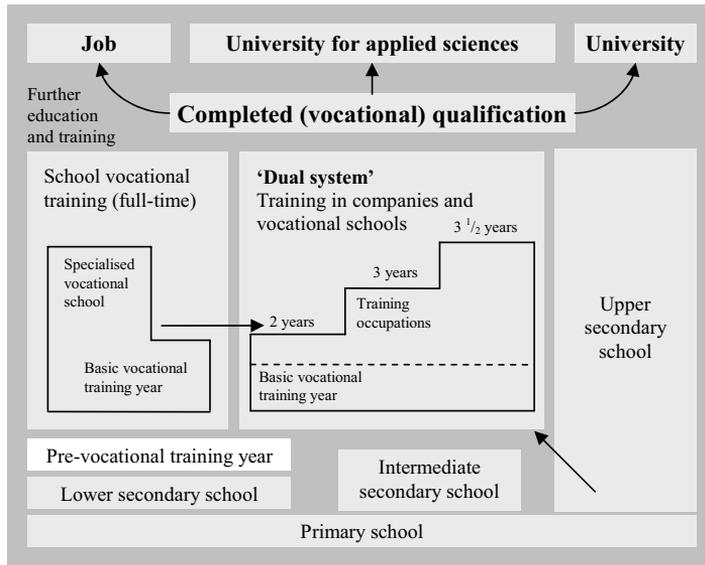
2. The German initiative for early identification of qualification needs

The skills and qualifications necessary for a successful occupational activity do not remain the same. Skills and qualifications are changing. Moreover, in our times of fast change, obtained knowledge becomes obsolete faster and faster.

In the face of accelerated change, in 1999 the federal government and social partners in the Alliance for jobs, training and *competitiveness (Bündnis für Arbeit, Ausbildung und Wettbewerbsfähigkeit*) passed a resolution to improve the early identification of new skill and qualification needs. The partners in the alliance agreed to inquire into the following questions:

(a) How is it possible to get information on current and future developments, in particular, on changing skill and qualification needs, to deliver a reliable basis for decision?

(e) How ought the educational system react to those changes?

(f) How is it possible to meet foreseeable skill and qualification needs?

It is of vital importance to all participating actors to get reliable data on qualification development. Participating actors include:

(a) social partners,

(b) enterprises,

(c) employees,

(d) educational institutions,

(e) other vocational education and training actors.

The DGB welcomed the Federal Ministry of Education and Research (BMBF) initiative for early identification of qualification needs, which started after the partners resolution in the alliance for jobs. The DGB has taken part in the initiative since 2001: first by carrying out preparatory work. Then, since 2002, by taking part in the qualification and counselling project LeA (Life and work).

Now, 11 institutions and organisations belong to the initiative which include:

(a) several research institutions,

(b) an education organisation,

(c) the Federal Institute for Vocational Training (BIBB),

(d) the German Confederation of Trade Unions (DGB),

(e) the German Employers' Organisation for Vocational Training (KWB).

These institutions and organisations are linked in the FreQueNz network for early identification of qualification needs. One part of FreQueNz is an Internet platform. It presents partner institutions and organisations as well as research projects. Above all, it makes research results available to the public.

The users of FreQueNz information are:

(a) political actors,

(b) social partners,

(c) the employment administration,

(d) research institutions,

(e) educational organisations,

(f) associations,

(g) enterprises,

(h) employees.

Figure 2: Partners and users of FreQueNz

FreQueNz compiles research findings and makes them available to different user groups
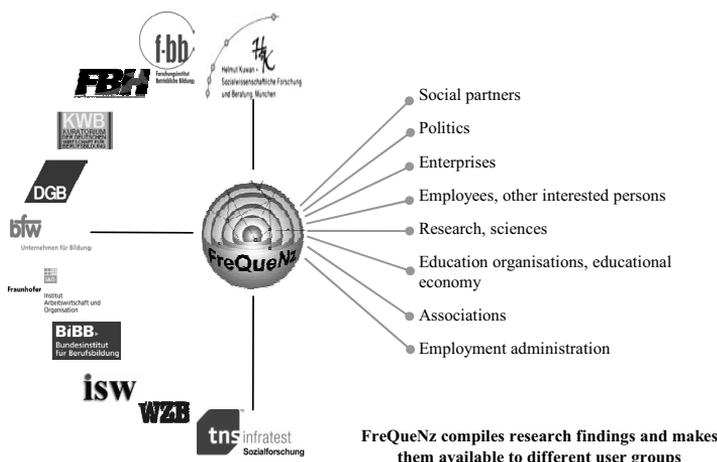
Source: Schmidt and Steeger, 2004.

On early identification, the social partners are less interested in long-term forecasts. They prefer concrete and reliable hints to new trends in a medium-term perspective relevant to vocational education and training.

Compared to later developments, long-term forecasts on the demand for qualifications and skilled personnel have proved to be unreliable and difficult. Further, it turned out that reliable statements derived from long-term forecasts can barely be made. One reason is the complexity of the relevant factors and their interaction. Nevertheless, early identification is important as it shows future trends and developments for which we do not yet have structures in the vocational and educational system.

What are the national activities on early identification in Germany?

First, the BMBF launched the FreQueNz network for early identification of qualification needs. Within FreQueNz the ministry supports different projects as part of the early identification initiative. Major objectives of the initiative are:

(a) continual qualitative identification of changes in different fields of work; the identified changes serve as a basis to achieve the next objective;

(b) definition of the qualifications which will become necessary for future different fields of work;

(c) recording the supply of qualifications; identifying deficiencies and shortages in the supply;

(d) testing and developing methods for early identification of qualification needs.

3.   Further national activities for early identification in Germany

The BMBF supports development of the *Arbeitsmarktradar,* a system of future-oriented labour-market monitoring. This includes a feasibility study as well as development of diagnosis instruments for labour-market shortages within a five-year projection of the labour-market.

BIBB is actively involved in early identification in the framework of the system for early identification of qualification developments (*Früherkennungssystem Qualifikationsentwicklung*). BIBB is supported by social partners, and jointly by the federal government and the German *Länder*.

Germany is a federal republic and a great part of educational policy is the responsibility of the *Länder*. Among others, the *Bund-Länder* Commission for Educational Planning and Research Promotion is assigned to coordinate federal and *Länder*-specific educational policies. It provides studies relevant for the early identification of skill needs, such as the so-called *Future of education and labour report* (*Zukunft von Bildung und Arbeit*).

Figure 3: German early identification activities

- **BMBF**
  - Early identification initiative
  - FreQueNz (early identification network)
  - *Arbeitsmarktradar* (future-oriented labour market monitoring)
- **BiBB** (German Federal Institute for Vocational Training)
- **BLK** (*Bund-Länder* Commission for Educational Planning and Research Promotion)
- *Länder* activities
  - Labour market monitoring
  - studies on skill needs

- **Selective investigations of other actors**

The *Länder*, and several regions in different *Länder*, pursue their own region-specific activities for early identification. For example, the regional network of Ostwestfalen-Lippe or EQUIB Bremen, which established a regional monitoring system for qualification development. Further examples are regional activities located in Cologne and Thuringia where regional labour-market monitoring is undertaken and surveys on skill needs carried out.

Besides that, investigations on skill needs and qualification development are carried out by:

(a) sector-specific associations, such as: the Association of Engineers (VDI) and the German Association of Information Technology, Telecommunications and New Media (BitKom),

(b) the Institute for Employment Research of the German Federal Employment Services (IAB),

(c) several foundations, such as the Hans-Böckler Foundation, Friedrich-Ebert Foundation, Konrad-Adenauer Foundation and the Bertelsmann Foundation,

(d) other stakeholders.

4. Trade union activities for early identification in Germany

Of course, the DGB and the DGB trade unions are also working on early identification issues.

One reason for this commitment is that forecasts on skill and qualification needs are of vital importance for modernising initial and further training regulations. Collective agreements as well as work agreements are important instruments to secure continual observation of skill and qualification needs.

Collective agreements on further training were concluded for the metalworking industry of Baden-Württemberg as well as for the German chemical industry. According to these collective agreements, employees, for instance, are entitled to an annual consultation with their employers. These consultations serve to determine employees' individual training needs. These collective agreements support future-oriented human resource development. Work and staff councils are also important actors. Based on the employment constitution act, work and staff councils are able to take the initiative to determine in-company qualification needs. In

this way, work and staff councils contribute to monitoring qualification developments as well as future skill and training needs at company level.

Figure 4: Activities of trade unions

- Collective agreements
- Works and staff council activities

- Continual monitoring by expert departments of trade unions

- Working groups in relation with the renewal of initial and further training regulation

- Selected projects: - *CIWES*
  - *Kompass*
  - *Agentur Q*

Further, trade unions initiate projects on training and early identification of skill needs. The trade union of the mining, chemical, and energy industries (IG BCE), for instance, launched the Ciwes project. It investigates the further training offers and needs of the chemical industry. The aim is to identify the main features of future-oriented further training system for the industry.

The social partners of the metalworking industry in Baden-Württemberg, the regional IG Metall trade union and the employers' association Südwestmetall, carried out the Kompass project. Its subject was participative educational planning. The Agentur Q represents a further initiative of the social partners in Baden-Württemberg. The task of this agency is to support companies implementing the mentioned collective agreement on further training for the metalworking industry of Baden-Württemberg.

Monitoring skill and qualification needs is a continual task of trade union experts. When renewing training regulations in the 'dual' VET system, due to changed qualification demands, experts form working groups. All these activities are important contributions to the early identification of qualification needs. At the same time, they contribute to implementation and transfer of measures to meet qualification needs within the VET system.

As an umbrella association, the DGB is a leader of the qualification and counselling project LeA (life and work). LeA is part of the early identification initiative of the BMBF.

At first, LeA investigated changes as well as skill and qualification needs in selected SMEs in the healthcare, metal and electrical industries. The subjects of investigation were concrete needs for support, guidance and counselling for in-company actors.

On this practical basis, the project develops a training coach profile. A training coach should advise employees on organising their working lives and individual development of skills. Training coaches are in a key position to disseminate and transfer early identification results into practice. They are also experts on changes within companies.

From such a perspective, training coaches can help identify new developments.

Transfer of results in the pilot project 'training coach'

→ Early identification of qualification needs in knowledge-intensive fields

→ Development of strategies for the acquisition of competences and qualifications

→ Test of the concept on qualification and counselling in the pilot project 'training coach':
  - *as an autonomous qualification profile*
  - *as an adult education profile*
  - *as an additional qualification for works and staff councils*

➤ **Identify new qualifications in knowledge-intensive fields**
  Develop a concept on qualification and counselling: 'training coach'

Besides the training coach profile, the project is developing and testing an additional coaching qualification for work and staff councils. By initiating surveys on training needs, employee representatives can contribute to early identification of training needs at company level.

5. The German initiative for early identification of qualification needs – benefits and needs for action

Apart from the activities of the social partners, it is necessary to stress once more the early identification initiative of the BMBF. What benefits can actors in general and vocational education policy derive from early identification activities? What action is needed from the perspective of a trade union confederation?

Developing and providing current information on new skill and qualification trends from the FreQueNz network serve to support modernisation of the vocational education system. Results of early identification research can provide all involved – from individual employees to policy-makers – with a better basis for decision and action.

Nevertheless, publishing results does not automatically lead to their implementation, or transfer into practice. Decisions are mostly not taken in the research or network arena, but in quite different places. At first, for instance, employers' decisions remain untouched by results of early identification research. A market of information and opportunity in itself cannot bridge the transfer gap between results and their implementation. Permanent guidance and counselling of research is missing as a link to decision-makers.
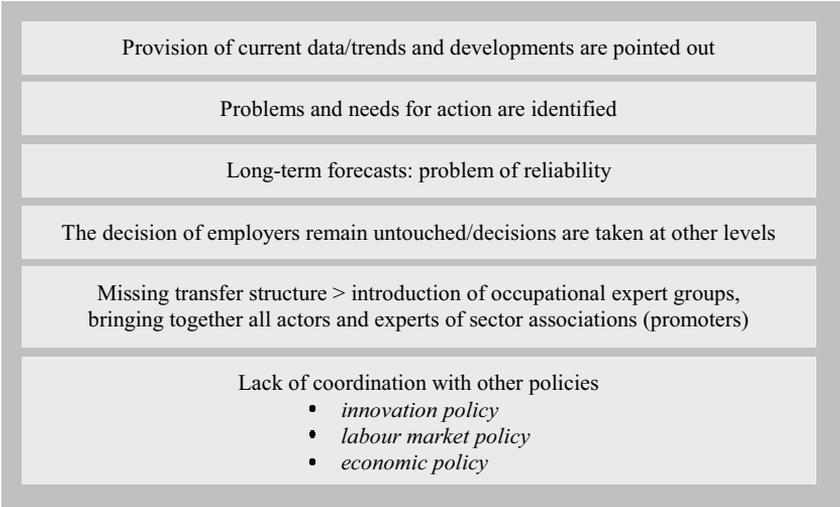
Thus, a structure which helps transfer research results to those responsible for renewing initial and further training regulations is necessary. On transfer into practice, the DGB recommends including associations of affected occupational groups so companies accept renewed training profiles.

The expert group for initial and further training in the alliance for jobs favoured establishment of occupational expert groups (*Berufsfachgruppen*). Such a body could foster the transfer of results into policy. At the same time, it could foster acceptance of new and renewed training profiles.

In the DGB's opinion, there are further needs for action for a better integration of early identification into other strategies of the German federal government. For instance, early identification of skill needs could be linked with the German innovation offensive. This could be helpful because future-oriented and skilled people are the basis of each innovation.

Measures to promote innovation, considering human resource development and work organisation which fosters learning processes, could contribute to achieve the Lisbon goals.

Figure 6: Benefits, weaknesses, needs for action

Provision of current data/trends and developments are pointed out

Problems and needs for action are identified

Long-term forecasts: problem of reliability

The decision of employers remain untouched/decisions are taken at other levels

Missing transfer structure > introduction of occupational expert groups, bringing together all actors and experts of sector associations (promoters)

Lack of coordination with other policies
- *innovation policy*
- *labour market policy*
- *economic policy*

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PART III

Building systems of early identification
of skill needs in transition

Janno Järve and Tiina Annus
**Building a system of early identification
of skill needs in Estonia: sectoral studies**

Věra Havlíčková, Michal Franta and Martin Guzi
**A system for forecasting skilled labour needs
in the Czech Republic: putting research results into practice**

Catalin Ghinararu
Investigating skill needs and training demand in Romania

Building a system of early identification of skill needs in Estonia

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This contribution presents results of several years developing a system of early identification of skill needs in Estonia. The system consists of two approaches largely based on the Irish methodological model: comprehensive sectoral studies and aggregate-level occupational forecasting. So far, four sectoral studies have been prepared. Recommendations are being discussed with stakeholders, whose commitment to implementation is considered crucial in the implementation phase. Discussions and workshops during the sectoral studies elaboration brought a better understanding of the duties of the main human resources development stakeholders. Various government bodies undertook active steps for establishing a system of regular forecasting of skill needs at aggregate level. To implement these, closer cooperation with different actors will be necessary.

1.   Introduction

By November 1997, the following labour-market information was available to policy-makers and other market actors in Estonia:

(a) regularly produced official data on employment, unemployment and the labour force, which could be used to identify aggregate quantitative trends by sector, occupation, age, etc.;

(b) ad hoc surveys and analyses limited either to specific sectors or to specific issues (e.g. labour shortages); these provided rather partial, but usually quite detailed information;

(c) analyses producing 'softer' or qualitative-type information; these concentrated on issues such as the changing content of individual jobs;

(d) on the supply side – data on the annual outflow from the education system (both general and VET).

In practice, all four types of information were essential for understanding the direction of change in the labour market. Such understanding was important to those responsible for central planning of vocational education and training. A second issue was the extent to which that information was 'forward-looking', in the sense to provide a basis for forecasting future trends.

The labour market information system had two main deficiencies.

First, there was no established focal point with the necessary resources to assemble and analyse the available information from an occupational point of view. As a result there was no widely-shared and well-understood consensus on the occupational structure of employment and on the forces which could influence it at that time. Publication of the first labour force survey (1995) became available in the second half of 1997 and a decision was taken to update it at regular

intervals. This provided an opportunity for studies of changes on the labour market and in the occupational structure to benefit various actors in the labour market and the VET system.

Second, attempts to forecast future trends in occupational demand and supply were limited. A 'forward-looking' approach was a feature of some of the ad hoc studies and of the work being undertaken for developing national qualifications. The value of these exercises was reduced, however, by the absence of knowledge on a broader context of economy in which qualification requirements could be interpreted.

According to the feasibility study conducted by Terry Corcoran (senior economist from FÁS, the Irish Training and Employment Authority) in December 1997, there were two main ways to develop a broader overview of skill needs for the future:

(a) through systematic studies of specific manpower and training needs of individual key sectors or branches of activity, which are firmly rooted in a strategic assessment of the current position in, and prospects for, the sector concerned;

(b) aggregate-level assessment of the prospects for change in the occupational structure of employment and of labour supply, based on consensus or a widely-accepted macroeconomic forecast.

Both of these approaches have been used with some success in Ireland. The question was whether these approaches could be implemented in Estonia given *inter alia* data and expertise availability, and the state of the country's transition to a market economy.

To find out how to move on in Estonia on identifying future skill needs the two approaches were examined by Terry Corcoran together with Estonian experts and the following future actions were suggested:

(a) sectoral studies: to start at least two initial sectoral studies based on the Irish model, and to extend the scope to additional sectors over time. Given their importance for future Estonian economic prospects, as natural resources and following long-term traditions, food production and processing forestry products were chosen for the study;

(b) aggregate-level assessments: to develop an overall occupational forecasting model.

As the first surveys of enterprises and employers organised by the Estonian National Observatory also gave some feedback on recruitment problems, the Estonian Foundation for Vocational Education and Training Reform proposed to start with sectoral studies to support both sides – training providers (VET institutions to modernise the training process) and employers (to understand the need for cooperation with training institutions to upgrade workforce skills according to the real need of enterprises).

There was also a strong belief that the process of conducting sectoral studies would support deeper cooperation between all different stakeholders (the bodies representing enterprises, VET providers, government ministries, union representatives and individual companies) close to and interested in training and employment.

The aim of a sectoral study according to the Irish model, is to set out the probable future situation of a specific industry sector in economic, social and other developments over a five-year time-scale, and recommend the manpower and training interventions required to

support this development. The prime purpose is to help the various stakeholders make good decisions on manpower and training activities relevant to the sector. These stakeholders include bodies representing enterprises, VET providers, government ministries, union representatives and individual companies themselves. Specifically, one aim of a sectoral study is to identify and prioritise key skill areas for which VET interventions are required.

A sectoral study also provides feedback on the quality of provision of education and training for the sector and hence allow education/training providers to modify their programmes. It also provides indications of the numbers of persons likely to be recruited by the sector and hence the need for initial education/training provision. Another aim is to indicate to individual enterprises the types of changes required for success, and assist them in identifying their own training needs and plans. Funding training programmes for the unemployed would also be influenced by a sectoral study as it would identify the broad numbers and types of courses needed for a particular sector.

2. Main features of a manpower and training needs sectoral study

The study defines the sector and its constituent subsectors and goes on to describe the present position of the industry in terms of markets, enterprises, technology, workforce, business performance and other relevant factors. It identifies and assesses market opportunities and threats using a SWOT analysis and spells out the technological, legislative, trading and other changes likely to affect the industry. Changes due both to the global market and to changing international trade patterns are identified and their importance assessed as much as possible. The present position of enterprises in the sector vis-à-vis foreign competition is analysed and benchmarked.

The study then sets out the market, business, technological and manpower position required for success in the industry in the future. It may be useful at this stage to set out several scenarios based on different assumptions and explore their consequences and, in particular, the measures needed to achieve the most favourable one. The changes that enterprises in the industry and related industries need to make to achieve this positive outcome and, in particular, the manpower, skills and training changes required can then be presented. Conclusions on manpower and training should clearly follow from analysis of markets, technology, etc. This strategic analysis should be fully linked to that of government and other organisations and should build on their work as much as possible with resulting benefits to all.

Finally, the study should go on to indicate in detail the manpower and training actions needed in the core areas of the sector to achieve the strategy set out for the industry. The study should also develop a methodology for updating its results regularly.

Typically, a study would have a five-year time horizon but would also address key issues that will affect the sector over a longer time scale.

3. Methodology of a sectoral study

The methodology for a sectoral study needs to take cognisance of any special factors or priorities in relation to a sector, including the types of information already available. However, a broad,

standard, methodology was proposed, which could be adapted to particular cases. The main activities involved in a study should be in the following four broad phases.

3.1. Information gathering

(a) gathering business and manpower information and statistics on the sector, including comprehensive statistics on existing employment in the sector (and subsectors) for the main occupations;

(b) surveying enterprises in the sector to find out their current situation, plans for the future, difficulties and suggestions for improvement in a range of areas including markets, technology, work organisation, manpower and training;

(c) obtaining information on relevant legislation;

(d) obtaining information on other relevant changes;

(e) obtaining information on developments in other sectors which might affect the sector under review;

(f) analysing existing reports on the sector both in Estonia and overseas, and comparing performance of the sector with international competitors;

(g) discussing development of the sector with relevant government ministries and development agencies, and obtaining information about their strategies and policies for the sector;

(h) obtaining the views and proposals of other stakeholders in the industry including employer and union representatives;

(i) obtaining information on technological developments (at home and internationally);

(j) gathering information on existing education and training provision of specific relevance to the sector, and its adequacy.

The information gathering phase must be conducted through a mixture of desk research, a survey of companies in the sector, in-depth discussions with stakeholders and industry seminars. Establishing comprehensive industry statistics should draw as far as possible on existing sources. The company survey should ideally be limited to essential questions to provide information not available from other sources.

As an example, the information gathering shown in Table 1 was planned during the information and communication technology sector study in 2002 depending on the defined sector size.

To understand in details the gap between existing and needed skills, two focus groups were planned with the managers of main work processes of the sector. To learn the main obstacles related to teaching of vocational skills one workshop was planned with teachers and lecturers of VET, higher education and further education institutions.

Tentative recommendations were to be discussed during the workshop before finalising the report with key representatives of the sector to study the possibility of implementing the proposals.

Table 1: Example of the information gathering

Information sources	Number of interviews
Telephone interviews with representatives of enterprises of sector	100 telephone interviews
Telephone interviews with the major users of sector products/services	50 telephone interviews
'Face to face' interviews with representatives of enterprises of sector	35 interviews
'Face to face' interviews with representatives of the major users of sector products/services	3 interviews
Sector relevant purchasers	4 interviews
Educators:	
• VET institutions	4 interviews
• Higher education institutions	4 interviews
• Further education institutions	3 interviews
Sector relevant vendors	2 interviews
Sector relevant unions	3 interviews

Source: PW Partners, 2002.

3.2. Analysis

(a) establishing a company database for the sector;

(b) analysing likely international developments in the sector and Estonia's position *vis-à-vis* them;

(c) identifying the key factors that will determine whether or not Estonian enterprises will be competitive in the future based on a SWOT-type analysis;

(d) analysing the desirable future direction of the industry, considering industrial and other government strategies, and the industry's own performance capacity;

(e) calculating the manpower and skill implications of developments that primarily affect the sector;

(f) calculating the number of employees by main occupation likely to be employed in the sector in the future;

(g) calculating the number of new entrants required by the sector to satisfy both expansion and replacement needs;

(h) estimating the amount and type of training required by new entrants;

(i) calculating the number of existing employees requiring training and the kind of training required.

3.3. The study report

The study report presents a general analysis of the sector based on the information and analysis outlined above. This includes the present situation of the sector, the factors leading to change in the future, and a proposed response by government agencies, particularly the VET sector and the training arm of the Ministry of Social Affairs, and by the sector itself to these future changes. The manpower and training recommendations should emerge clearly from analysis of developments affecting the sector. In addition, the study report should:

(a) provide broad indications of the number of employees requiring training and retraining, indicating the type and duration of training required over the five-year period;

(b)   provide broad indications of the number of new recruits needed annually in the sector, over the five-year period, indicating the types of employees and skills required (particular attention should be paid to occupations requiring a formal skill training programme of extended duration for which forward-planning is required if shortages/surpluses are to be avoided);

(c)   indicate the kinds of changes that enterprises should make in the future to be successful ([45]);

(d)   indicate special initiatives that may be needed to promote or develop training and human resources development (HRD) in the sector;

(e)   indicate the types of actions required by other government ministries and agencies to achieve the outcomes recommended in the report;

(f)   provide a clear basis for updating the manpower and training results of the study.

3.4.   Implementation

Following completion of a sectoral study it is essential the main bodies involved, primarily the Ministries of Education and Social Affairs, in conjunction with other stakeholders, draw up a clear action plan to implement the recommendations. The action plan should include activities, responsibilities, resources and time-scale in relation to each recommendation. The report and the action plan should be published and efforts made to seek commitments to its recommendations from all parties.

A review process after two or three years should be built in to assess the success of implementation and also update the study to take account of new circumstances.

4.   Estonian sectoral studies in practice

According to the guidelines for sectoral studies described above, and considering proposed methodology in 1998, four different sectoral studies have been conducted in Estonia so far:

(a)   wood processing and furniture sector (1999);

(b)   metalworking, engineering, machinery and equipment (2001);

(c)   information and communication technology (2002);

(d)   food processing (including a tool to anticipate skill needs in subsectors based on the planned number of sales and exports) (2003).

All sectoral studies have been conducted based on the main methodology following the Irish experience. The use of studies is nationwide from both sides – VET schools as main providers and enterprises and employers organisations as partners in building qualification standards.

It is important to emphasise that all sectoral studies have been conducted in full flexibility to maximise their relevance to different industry sectors. They all are based on a forward-looking, industry-based, strategic development approach to identifying HRD needs. They all provide advice across the range of HRD issues. However, in some cases, the emphasis is on a quantified

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([45])   As well as being of value to enterprises themselves, this information could also be used by public bodies in any promotion-of-change efforts.

approach to identifying training needs, while in others training quality and changes in skill requirements may be more important. Some emphasise developments and HRD responses within firms, others the actions required from external organisations. The nature of the industry itself, and the adequacy of the existing HRD infrastructure for the sector, is among the factors which affects the balance of any sectoral study.

As expected, the time delegated to the sectoral studies, discussions and workshops have brought about a better understanding of duties of main stakeholders related to human resources development. As a sign of the needed cooperation an *Agreement on common action in speeding up the process of matching the labour force qualifications to the needs of the labour market in 2001-2004* (Annex 1) was signed in December 2000 by the Minister for Education, the Minister for Economic Affairs, the Minister for Social Affairs, Executive Director of Estonian Association of Employers and Industry, Executive Director of Estonian Chamber of Commerce and Industry, and the Chairperson of Estonian Central Union of Trade Unions.

This agreement was a major step towards the more coordinated actions in modernising vocational education. The conclusions of implementation of the first *action plan* of VET modernisation during 2001–04 are made and new plan for the years 2005–08 drawn up taking into account the general recommendations from sectoral studies as well.

5.   Aggregate-level assessments

At the beginning of 2003, the first step was taken towards regular forecasting of educational needs. The Estonian Ministry of Economic Affairs and Communications started to prepare long-term employment forecasts. The tool used was a macro model called Hermin, which is similar to the Irish model. The forecast has been corrected with sectoral models and expert assessments. As a result a forecast exists for 29 economic sectors, benefiting strongly from input provided by larger companies and employers' unions.

In 2004, the forecast was improved by a new dimension to the aggregate employment forecast, which added the structure of occupations (ISCO 88) inside each sector. There were also significant improvements to the qualitative and quantitative data provided for describing developments in each sector.

At the end of the same year the Ministry of Education and Research initiated a programme to match skills and training (initial and further) needs. The goal is to establish a system for anticipating skill needs (by the level and field of education and by economic sector). The first studies commissioned are on transition of graduates to the labour market.

6.   Plans for the future

The most important shortcoming of the present forecast is it does not assess educational needs, nor does it provide us with an estimate of how many additional workers will be needed in this sector. It only forecasts the employment figures. In 2005 two major improvements are expected. First is a flow analysis to forecast the need for additional workers, using data from the Estonian Customs and Tax Office. As ISCO-88 major groups of occupations are broad,

the concept of 'key occupations' is introduced with these occupations linked to occupational standards. This gets us significantly closer to estimating educational needs. Furthermore, surveys by groups of experts are carried out in all major economic sectors, involving representatives from companies, VET schools and the Estonian Qualification Authority.

To implement initiatives deeper cooperation between the Ministry of Economic Affairs and Communications, the Ministry of Education and Research, Tartu University, other research institutions and employers representatives is indispensable.

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Annex 1: Agreement on common action to speed up the process of matching labour force qualifications to the needs of the labour market in 2001-04

Main objective: Estonian labour force is highly qualified and competitive under the conditions of an open labour market

Objective	Ministry of Education (MoE)	Ministry of Social Affairs	Ministry of Economic Affairs	Employers	Trade Unions
Utilisation of the national employee qualification system	Participation in the work of vocational councils; schools' participation in developing the vocational standards, National Examination and Qualification Centre participation in preparation of examination materials.	Elaboration of the national employee qualification system; coordination of the work of the vocational councils, preparation of the law on Vocations; organising the qualification examinations with the social partners	Participation in creation of the national employee qualification system	Participation in elaboration of the qualification requirements, preparation and organisation of the qualification examinations	Participation in organisation of the qualification examinations organised by professional unions
Labour force forecast, based on the needs of the entrepreneurs and the public sector					
Creating necessary number of study places in initial training	Monitoring the schools' readiness; calculation of the number of potential students with the local governments	Employment policy and the respective training needs	Entrepreneurship development forecast	Labour force needs forecast	Labour force needs forecast
Development of study programmes; raising teachers' qualifications, upgrading the material study bases according to the requirements of the programmes	Development of the programmes according to the requirements of the vocational standards; review of the teachers' qualification requirements; vocational teacher training; modernising the material study bases of the leading VET schools in the field, with the innovation centre Foundation VET Reform in Estonia and the VET Promotion Union.			Coordination of the study programmes; organisation of the teachers' in-service training and practice in enterprises.	Coordination of the study programmes
Planning a professional career	Concentration of the information; dissemination to the schools; training the counsellors	Involving the counsellors at the regional employment offices in helping the students with their vocational training and career choices	Providing the MoE with the entrepreneurship analyses	Introduction of the field and work to the young; concentration and provision of information to the MoE	Introduction of the fields and work tasks to the young with the professional unions; concentration and provision of information to the MoE
Practical training	Review of legislation; training the mentors working in enterprises; financing the enterprise practice foreseen in the study programme	Supporting the creation of the enterprise practice positions through the employment programme	Supporting the creation of the system of enterprise practice positions	Creation of the conditions for practical training	Monitoring of the practical training
Monitoring the results	Evaluation of the quality, results and efficiency of VET schools activities by the National Examination and Qualification Centre with the vocational councils and professional unions	Evaluation of the training efficiency in the subsidised work positions		Participation at the external evaluation	Participation at the external evaluation
Work related complementary- and retraining	Review of legislation; vocational teacher training; creation of training places for adults in VET schools	Labour market analysis; ordering the entrepreneurship related training; system of the start-up money		Planning and ordering the work related complementary- and retraining	Planning and ordering the work related complementary- and retraining
Developing regional vocational education and training centres	Development of the vocational education and training centres to support regional development; ensuring investments for speeding up the developments	Coordination of regional employment		Directing developments via participation at the school councils	Directing developments via participation at the school councils
Youth friendly labour market.	Career planning guidance	Creation of subsidised work positions through employment programme	Fostering job creation through enterprises' organisations	Creating jobs for graduates considering the coordinated training needs	Supporting and monitoring the process of job creation.

A system for forecasting skilled labour needs in the Czech Republic: putting research results into practice

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This contribution provides information on forecasting skill needs in the Czech Republic with a primary focus on the conditions under which the system of forecasting operates today, some problems and possible solutions. As there is no coordinated approach to identify skill needs by the State and no institution or organisation responsible for regular forecasting, developments may only emerge in various research or other projects at national or regional levels, and sometimes at sectoral level. There is an inherent risk of the outcomes being incoherent and scattered.

1.   Introduction

Forecasting skill needs to meet the requirements of the market economy was addressed for the first time some five years ago. Planning processes applied in the socialist system were eliminated as a natural consequence of transforming the economy and society. In the 1990s, insufficient information on the required focus of vocational education and employment prospects of various occupations caused increasing anxiety. There were no instruments or processes in place to generate such information. This is why the Czech National Observatory of Employment and Training (NOET) proposed an international project within the Leonardo da Vinci programme to develop a combined quantitative and qualitative methodology for medium-term forecasting appropriate for Czech conditions and inspired by Dutch, Irish and French forecasting experience.

The project ended and the question of who will use the methodology and regularly update the relevant information was faced. How to use the outcomes in practice? How to disseminate them to users?

Although the need for early identification of skill needs is mentioned in several official government papers, there is no government body responsible for it by law. Although these issues are related to the tasks performed by the Ministry of Labour and Social Affairs and the Ministry of Education, Youth and Sports, it is unrealistic to expect either of them to pursue this matter, use the methodology and provide the relevant funding. The project outcomes did not provide information on how the forecasting exercise should be organised, which institutions should be involved, how the results should be disseminated to users and how the process should be financed.

([46]) Michal Franta and Martin Guzi prepared Sections 2.1 and 2.2 of this contribution.

It is clear that developing a forecast and testing results is demanding in terms of sources of data and other information on employment, education, demographic trends, technological, economic and social changes, and monitoring international development. This requires cooperation between both institutions and experts who have such data or are able to generate them.

The NOET therefore drew up a proposal for a sustainable operational system for skill needs forecasting which identifies the institutions that should be involved, the activities that should be carried out and the financial resources needed. This proposal has been made for three relatively independent levels: national, regional and sectoral.

2. Proposal for a national system for skills needs forecasting based on quantitative methodology

The process illustrated in Figure 1 covers approximately a two-year period which should be the regular interval for forecasting. All possible activities, institutions and ways of funding related to the process of forecasting skill needs are incorporated in it. The proposal is based on the quantitative forecasting model developed earlier as part of the Leonardo da Vinci project. On the left side of the figure is preparation of input data and information for the quantitative model, in the middle the actual forecasting work and on the right are outputs of the forecasting model, expert testing of the quality of the forecasts and elaboration of outcomes for end-users. At the bottom of the figure there is a further development in forecasting methodologies. At the top is development of a national information network for forecasting activities of various organisations, and involving international networks such as Skillsnet.

It is necessary to stress that the figure shows an ideal situation. This means that it also includes activities that no institution currently performs in the Czech Republic (mainly regular elaboration of sectoral employment forecasts which are necessary input data for quantitative model calculations). It also includes processes that are not under way (mainly cooperation on expert evaluation of input data, testing the quality of forecasts and their development for end-users' needs).

Nevertheless, some components of the proposed system are already working. A quantitative forecasting model (model ROA-CERGE-EI) has been operated by the Research Institute of Labour and Social Affairs (RILSA) for over two years. RILSA purchases input data from the Czech Statistical Office and the Institute for Information on Education, produces – in cooperation with the NOET –a sectoral employment forecast, and cooperates with CERGE on further development of the quantitative model methodology. The results of these activities are included in research reports prepared for the Ministry of Labour and Social Affairs.

There are other initiatives under way that may contribute to forecasting, its evaluation and elaboration for end-users. For example, the National Institute for Technical and Vocational Education has for long been analysing the situation of school-leavers on the labour market. Next, the private company Trexima Ltd. has developed and operates an integrated system of typical working positions (ISTP) which contains detailed information about occupations in the Czech Republic. Information on employment prospects for various occupations developed using the proposed system for forecasting skill needs could also be fed into the ISTP in future.

Figure 1: Proposal for a skill needs forecasting system in the Czech Republic national level (quantitative approach)
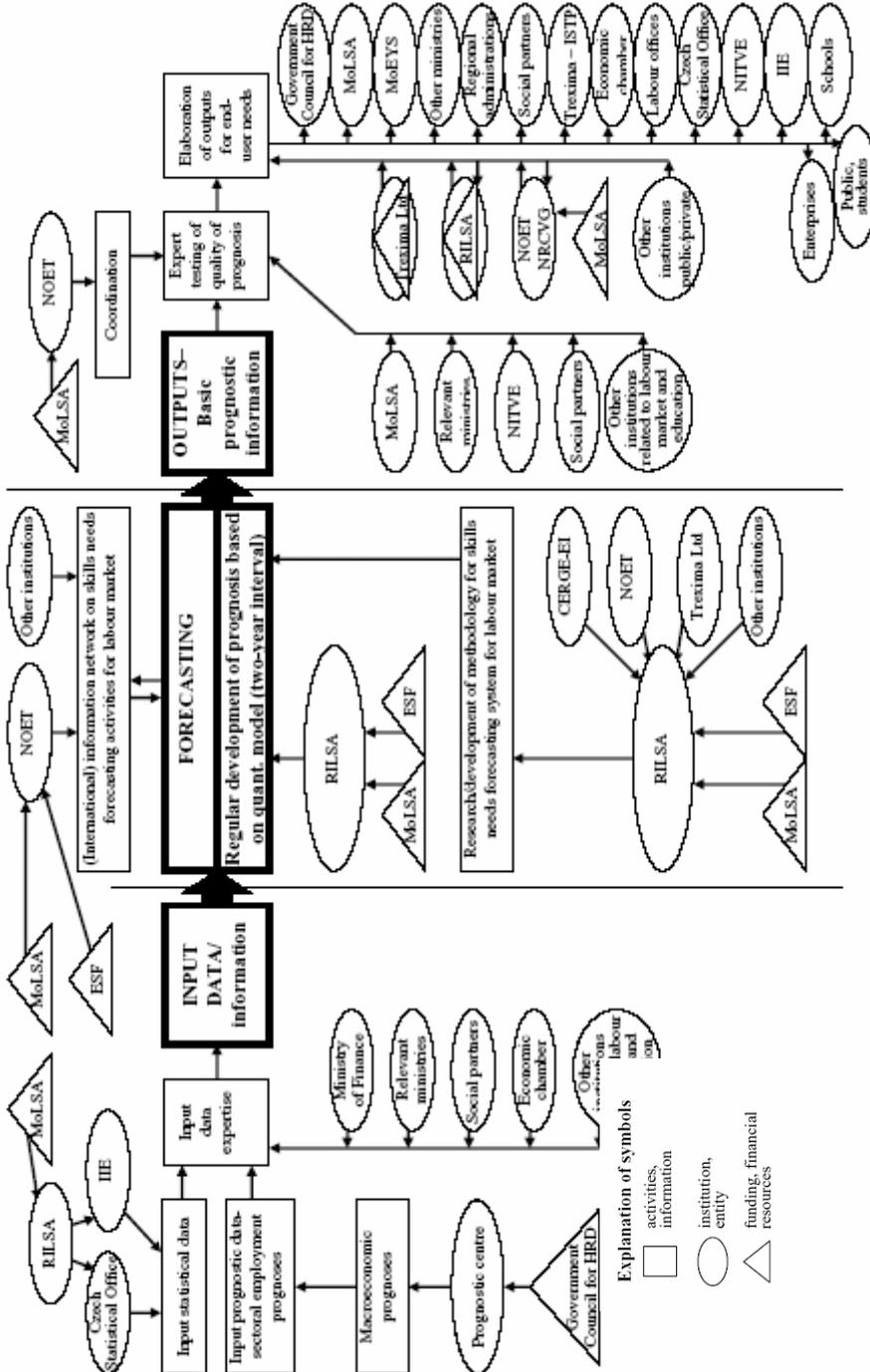
CERGE-EI	Center for Economic Research and Graduate Education, Charles University
ESF	European Social Fund
HRD	Human resources development
IIE	Institute for Information on Education
ISTP	Integrated system of typical working positions (developed and operated by Trexima Ltd)
MoEYS	Ministry of Education, Youth and Sports
MoLSA	Ministry of Labour and Social Affairs
NITVE	National Institute for Technical and Vocational Education
NOET	National Observatory of Employment and Training at the National Training Fund
NRCVG	National Resource Centre for Vocational Guidance, National Training Fund
RILSA	Research Institute for Labour and Social Affairs

Explanation of symbols

- □ activities, information
- ○ institution, entity
- △ funding, financial resources

Since there are no formal arrangements for cooperation between various institutions – cooperation is often only based on personal agreements – there is no guarantee that forecasting activities will continue. It is important for forecasting work to continue and follow on from the outcomes of previous forecasts. We recommend that an interinstitutional agreement be concluded between the major players in the forecasting process to ensure continuing cooperation. Players include data providers, organisations involved in forecasting work and the main customers who get the results. The agreement should set out the tasks to be performed, ways of funding and ways of handling the outcomes.

The agreement itself remains a problem. Most major players in the national forecasting process are State institutions or, better said, institutions of a State administration. It is, therefore, a matter of political consensus whether or not regular forecasting skill needs will be approved and appropriate financial resources earmarked. At a time when the government is tackling a budget deficit it is perhaps naïve to expect additional funding. NOET developed the proposal described above for a system of regular forecasting for the Ministry of Labour and Social Affairs less than two years ago. There has so far been no response and it has not even been discussed.

Despite this, the situation is not all that bad. In its research programme the Ministry of Labour and Social Affairs set out challenges related to early identification of skill needs. Forecasting activities will continue and will be funded from a grant that NOET and the Research Institute of Labour and Social Affairs obtained from this ministerial research programme for a five-year project (until 2009). They plan to develop subsequently two national forecasting versions and one sectoral study. They will use the methodology developed within the Leonardo project mentioned earlier. They also expect that cooperation between various institutions during the project will help establish links which, in due time, may form a basis for a better-organised and formalised system for regular forecasts. It could be a system similar to the one presented in this article.

2.1. Brief description of quantitative forecasting model ROA-CERGE-EI

The model is based on the model developed at the Dutch Research Centre for Education and the Labour Market (ROA). It is primarily considered as a beginning of the long road to precise and reliable results. Its schematic description is in Figure 2.

The model's main goal is to forecast a situation on the Czech labour market in a five-year time frame. Forecasts are computed for 60 professions and 35 educational categories. The future situation is obtained by comparing future demand for labour with future supply of labour for a particular category.

The demand part of the model is computed as an expansion demand together with a replacement demand. Expansion demand reflects the overall performance of the economy and is based on a macroeconomic model, which produces forecasts of the sector employment. Replacement demand is mainly caused by the need to replace part of the workforce because of retirement. It is based on demographic data. When expansion demand is positive it is equal to total outflow from the labour market. However, if expansion demand is negative, replacement demand equals total inflow on to the labour market.

Figure 2: Structure of the model ROA-CERGE-EI
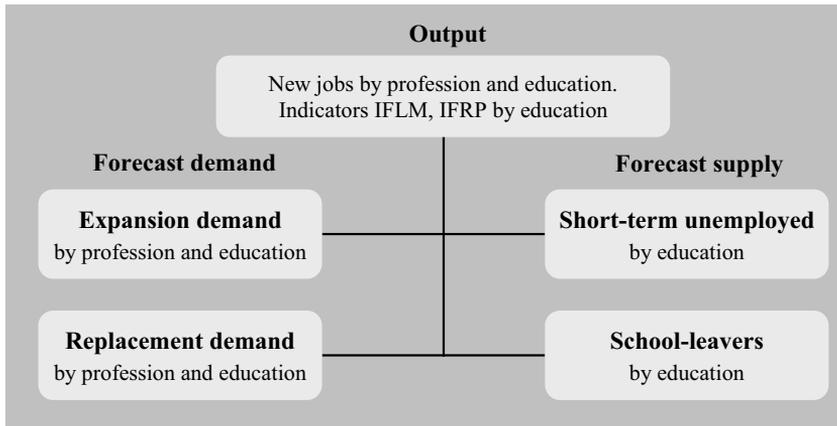
The supply side includes future school-leavers and short-term unemployed.

The weakest part of current model implementation is the macroeconomic model – the essential part of the expansion demand component. The macro model in use was originally developed for another purpose and is not therefore appropriate for forecasting ([47]). Therefore, the model should be improved by replacing the macro model with a more appropriate one.

2.2.   Results obtained by the ROA-CERGE-EI model

Essentially, the model compares the forecast of demand for workers by education with the projected supply of workers by the same categorisation. The projected supply side of the model is grouped in education category but we only know the educational background of school-leavers and short-term unemployed. We compute the key labour market indicators for each education category, where the indicator is equal to 1 when demand and supply are in balance. Before interpreting the results in Table 1, it is important to note that the ROA-CERGE-EI model does not yet incorporate the possibility of substitution across occupations.

The indicator of labour market prospects (IFLM) from the view of the worker and the indicator of recruitment problems (IFRP) in individual firms are computed with the only difference between them in assuming the replacement demand. For example, if IFLM prospects are less than 1 meaning there is a shortage of workers with a given education, then it is easier for workers to find employment. Similarly, IFLM prospects less than 1 corresponds to problems in recruiting workers with a given type of education while the values higher than 1 signal good recruitment prospects for firms.

In Table 1 are the results from the ROA-CERGE-EI model for 35 educational categories. The indicators give the labour-market prospects for the period 2004-08. The education categories are sorted according to their share of the total labour force in the Czech Republic.

([47]) Forecasts are made only for four sectors whereas the original purpose was to compare different macroeconomic scenarios.

Table 1: IFLM prospects, 2004-08

Degree of education	Specialisation	IFLM	IFRP	% labour force
Sec. w\o maturita	Mechanical engineering, metallurgy, Machine control and operation	0.90	0.94	13.17 %
Sec. w\o maturita	Trade, services	1.03	1.03	8.83 %
Sec. w\ maturita	Economics, trade, services	0.94	0.94	8.65 %
Primary	Primary education	0.99	1.04	6.56 %
Sec. w\o maturita	Construction	0.89	0.90	6.34 %
Sec. w\ maturita	Mechanical engineering	0.91	0.92	5.61 %
Sec. w\ maturita	Other subjects	1.06	1.06	5.53 %
Sec. w\o maturita	Electrical engineering, transport, communication	1.00	1.03	3.62 %
Sec. w\o maturita	Textile, clothing industry	0.93	0.99	3.49 %
Gymnasiums	Gymnasiums	1.10	1.10	3.44 %
Sec. w\ maturita	Electrical engineering	1.04	1.05	3.43 %
Sec. w\ maturita	Health	0.96	0.98	3.02 %
Sec. w\ maturita	Agriculture, forestry	0.93	0.93	2.51 %
Higher	Teacher-training	1.10	1.13	2.47 %
Sec. w\o maturita	Wood processing, shoe industry	1.02	1.04	2.29 %
Sec. w\o maturita	Agriculture and forestry	1.09	1.13	2.24 %
Higher	Economics, trade, services	1.28	1.28	2.13 %
Sec. w\ maturita	Construction	0.96	0.96	1.82 %
Sec. w\o maturita	Chemistry, food industry	1.10	1.10	1.33 %
Sec. w\ maturita	Teacher-training	0.98	1.01	1.19 %
Higher	Mechanical engineering	0.96	0.96	1.17 %
Higher	Health	1.21	1.21	1.16 %
Higher	Electrical engineering	0.99	0.99	1.08 %
Higher	Construction	0.91	0.91	1.03 %
Higher	Other social subjects	1.33	1.33	0.97 %
Higher	Natural sciences	1.25	1.25	0.90 %
Higher	Agriculture, forestry	0.94	0.94	0.80 %
Sec. w\ maturita	Natural sciences	0.93	0.93	0.74 %
Higher	Other technical subjects	1.15	1.15	0.69 %
Higher	Law	1.04	1.04	0.68 %
Sec. w\o maturita	Other	1.21	1.21	0.49 %
Higher	Other sciences and disciplines	0.90	0.91	0.46 %
Sec. w\ maturita	Law	2.81	2.81	0.09 %
W\o school educ.	Without education	1.16	1.24	0.02 %

3. Proposal for a regional system for skill needs forecasting based on a qualitative approach

NOET also tried to propose regional arrangements that provide for institutional links and activities on early identification of skill needs (Figure 3). This proposal may serve as a recommendation to regions (most of them) that have no experience in regular identification of skill needs.

In recent years, however, various activities for identifying future needs for skilled labour have also been developing at regional level because lack of relevant information is much more felt at regional than at national level. This has been particularly so since regions have assumed responsibilities for the long-term development of vocational education in their administrative areas.

It is appropriate to apply the qualitative approach when developing a medium-term forecast at regional level. Use of the quantitative model mentioned above is not suitable for Czech circumstances (low reliability of results).

The study should be initiated and coordinated by a public body acknowledged by the region for its political position or expert authority. This role could be performed by regional councils for human resources development which were set up in most regions in recent years. A coordination team for forecasting consisting of representatives of regional administration, social partners, professional associations, the economic chamber, labour offices and training organisations would provide an expert forum for discussion. Forecasting could be carried out by members of the team or a tender could be organised. Councils may also serve as a platform for all discussions on the trends identified and for pursuing consensus on the future need for skilled labour in the region, and appropriate arrangements.

4. Proposal for a system for sectoral/industry studies of future skill needs

Similar to regional forecasts, a qualitative approach is applied at sectoral level (Figure 4). The principle of so-called consensual prognostics is applied. This means that all findings and measures proposed are discussed with relevant parties operating in the labour market and education sector, with social partners and other players, to use their expertise and plans to formulate a common position observed by all parties concerned in their activities.

The role of initiator of a sectoral forecasting exercise could be assumed by the Government Council for Human Resources Development. It was established in July 2003 to support implementation of the national human resources development strategy ([48]). In view of its tripartite composition, its responsibilities for human resources development at national level and its operations with government backing, the council has qualified information at its disposal allowing it to make decisions on which sector or industry a study should be undertaken as a priority. The council can also initiate tenders and select organisations to carry out studies. The successful bidder for sectoral studies may be a research institution, university,

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([48]) Interlinking employment, vocational education, qualifications and entrepreneurship, the document *Strategy for human resources development in the Czech Republic* was adopted by the government in spring 2003.

consultancy, etc. The financial resources necessary should be provided by the council, professional associations and, possibly, by the European Social Fund.

5. Ways of funding forecasting activities

Stable arrangements for funding regular forecasting activities should be put in place. If funding regular work is based on project implementation where it is necessary to compete repeatedly for grants and to explain why the work should be done, it may have negative effects on continuity, quality of outcomes and economy.

Regular national activities include:

(a) quantitative model operation;

(b) provision of input data for the quantitative model including a forecast of the development of employment in sectors;

(c) expert analysis of input data for the model and the outcomes of forecasting;

(d) elaboration of the outcomes and their dissemination to end-users;

(e) operation of an information platform for forecasting activities and results.

At regional and sectoral levels stable arrangements should be put in place for the funding of the coordination team for skill needs forecasting. Alternatively, it could be incorporated in the regular activities of an organisation with overall responsibility for human resources development.

Financial resources from various research grant schemes could be used as a complementary source of finance for improving and developing the skill needs forecasting system and methodology, or for various additional activities.

Figure 3: Proposal for a regional skill needs forecasting system (qualitative approach)
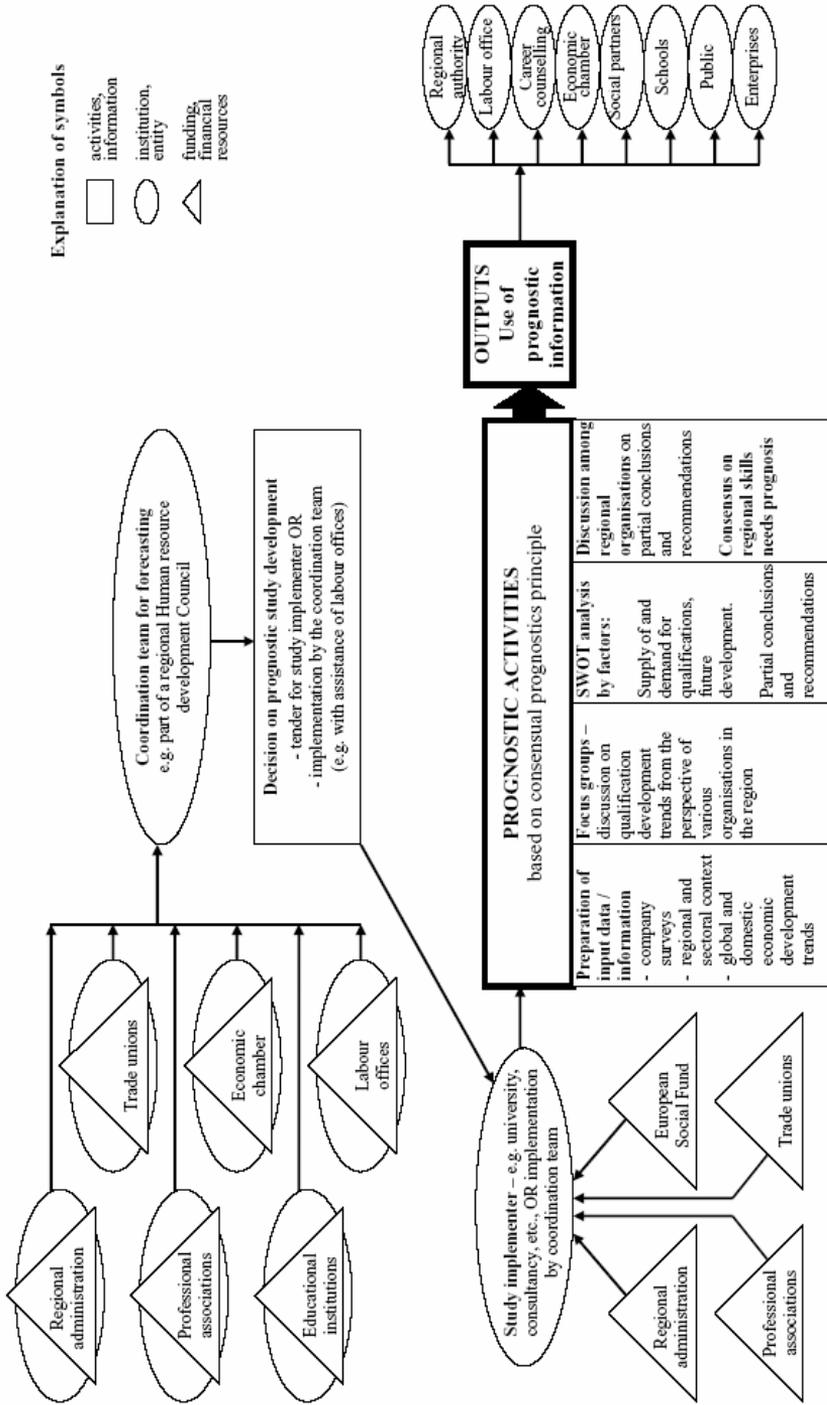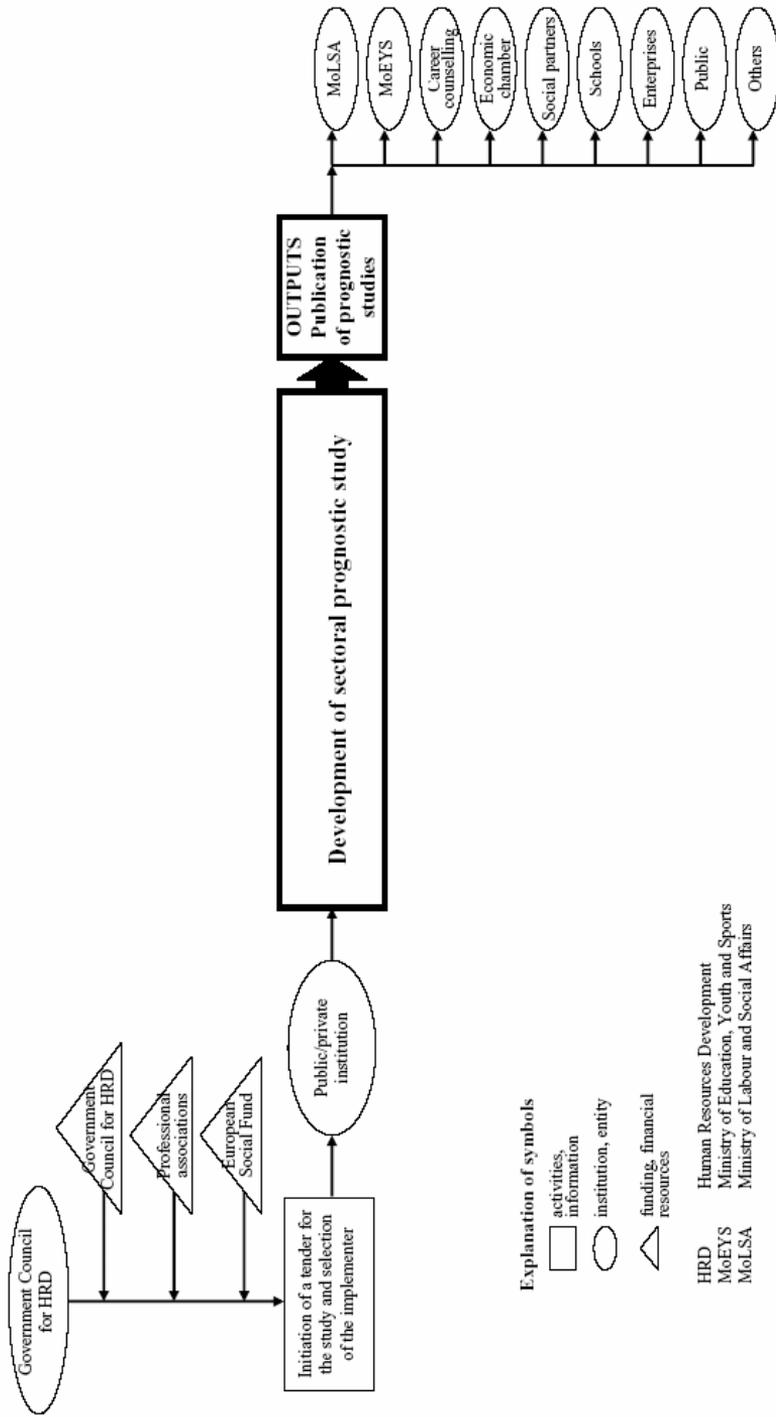
Figure 4: Proposal for a skill needs forecasting system by sector

Government Council for HRD

Government Council for HRD

Professional associations

European Social Fund

Public/private institution

Initiation of a tender for the study and selection of the implementer

Development of sectoral prognostic study

OUTPUTS
Publication of prognostic studies

MoLSA
MoEYS
Career counselling
Economic chamber
Social partners
Schools
Enterprises
Public
Others

Explanation of symbols

☐ activities, information

◯ institution, entity

△ funding, financial resources

HRD   Human Resources Development
MoEYS Ministry of Education, Youth and Sports
MoLSA Ministry of Labour and Social Affairs

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Investigating skill needs and training demand in Romania

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This contribution focuses on the progress achieved so far in developing and putting into practice a systematic methodological approach for identifying skill and training needs in the Romanian transition to a market economy. Two main approaches are distinguished: methodological approaches that rely solely on empirical research and those that while still employing empirical instruments go further by using econometrics. The conclusion shows that, while a system for identifying skill needs was slow to develop and has picked up only recently, repeated attempts have none the less resulted in an accumulation of knowledge capital, which has yielded two complementary approaches, useful to decision-makers and relevant stakeholders.

1.   Introduction

At the beginning of transition a rather unsystematic approach to identifying skill demand prevailed, with little or no continuity and with few or no links between the different actors. As the economy matured and stabilised after initial shocks, the different approaches improved and became more systematic. Recently, as economic growth has resumed and achieved sustainability at a pace that reveals a large amount of unused economic potential, training demand in itself has started to rise, albeit at a very low level, which has generated renewed interest in the topic. This interest has also been translated into a concerted effort stemming from a vast pool of stakeholders, with a strong incentive being the fast approaching date of EU accession. Apart from examples of several initiatives, special attention has been given to the main works recently undertaken by the National Research Institute of Labour which serve as reference points.

The first, which embodies the methodological approach that combines modelling with empirical field research, is the *Identification of the demand for skills and training in the regions centre and west of Romania. It* was undertaken in 2003-04 and its conclusive results, also assessed in several workshops with relevant stakeholders, will be extended at national level. This work has been commissioned by the Ministry of Education, Research and Youth.

The second, which embodies an empirical approach, is investigating the demand for skills and training undertaken by the same research institute for the Ministry of Labour, Social Solidarity and Family in spring 2004, in two designated industries, namely tourism and construction, and in two preselected regions, the north-west and the south-west. Using questionnaires, this research has had its results confirmed by a second empirical research, which targeted employers' associations representatives from the same regions and industries targeted in the first research.

The conclusion of the paper shows that, while a system of identification of skill needs has been slow to develop and has picked up only recently, repeated attempts have none the less resulted in accumulation of knowledge capital, which has yielded two complementary approaches, both useful to decision-makers and relevant stakeholders.

2. Early evolution of skills and training demand identification systems (1989-2000)

The period was marked by an intense but unsystematic effort to identify and quantify skill needs for enterprises alongside economic restructuring, and to assess the capacity of training supply to meet both existing and prospective demand.

The first attempts took place as early as 1991-92, as unemployment started to hit many industrial workers hard. The Ministry of Labour, which then administered employment offices, commissioned several small research and consultancy projects, carried out either by Romanian or by foreign consultants. Such approaches mainly employed empirical methods, trying to assess demand for training and skills in an extremely volatile economic environment. The results were disappointing, neither managing to give a precise account of the demand for skills and vocational training nor of the capacity and real state of vocational training. In the meantime, vocational training had started to assert its presence on the market, especially in large urban centres, taking over dynamic segments of the market where demand was growing, such as 'general purpose skills' (e.g. computer literacy, accounting, foreign languages) largely dominated by SMEs. The target clientele were and, to a certain extent, still are individuals rather than companies. Studies undertaken did not even attempt to make use of econometric modelling as instruments available at the time were unable to account for a transition economy. Several concepts of a transition economy and its evolution prior to as well as after fundamental market reforms were in their embryonic stage. It was in fact impossible to measure effectively demand for training and skills as it was difficult to assess what progress was made in reforming the economy as a whole and to project its development perspectives, other than by simple comparison with other transition economies.

While such an approach was attempted in a study on the demand for vocational training undertaken by the National Research Institute of Labour in the late 1990s, its results were only of limited use. The only tangible result was development of a methodology that allowed proper and non-distorted comparisons between different paths of transition and different paths of reform and development of vocational training systems in transition. A further limitation was they tended to overconcentrate on vocational training provided for the unemployed via the Ministry of Labour network. They therefore neglected a vast area of providers outside this segment of the market as well as training demand from individuals who were either employed or, if unemployed, deliberately avoided the above-mentioned network, which they regarded as ineffectual for employment prospects. Most studies failed to consider the emerging demand from private enterprises which also avoided the Ministry of Labour network and training processes in multinationals that started in the Romanian economy in the late 1990s.

As the restructuring process in the State sector increased its pace, massive lay-offs took place. The National Agency for Employment and Vocational Training, established in 1999 and at the time combined public employment service functions with that of a *de facto* national training and qualification authority, commissioned several active employment measures targeted at laid-off workers. The programmes, which for the first time contracted with private providers on a massive scale, also contained a vocational training component, with an associated compulsory reemployment target. Therefore, most providers sacrificed training and especially quality in training provision to achieve administratively and mechanically assigned employment targets,

which were a prerequisite for being paid for their services. As a result, a special segment of training providers developed, forming a lower tier of training supply, which specialised in 'tapping funds' from employment services for training the unemployed, mostly in skills demanded by low value-added industries (e.g. textile and leather).

Issues posed by such development were for the first time highlighted by a 1999 case study, as part of an assessment carried out for an active employment measure programme in the county (*judet*) of Dambovita (north-west of Bucharest). The study, while singular as an approach and not destined for publication, was narrow in focus. Nevertheless, it managed to show by using both anecdotal and empirical evidence, which was translated into a micro-set of indicators, the emerging mismatch between real demand for training from enterprises and individuals, especially those laid off by large enterprises and the type of supply encouraged by the labour redeployment programme. It highlighted that such an approach, while able to meet some short-term needs, failed to harness the real potential of labour supply and totally misdirected development efforts of the training industry by encouraging an easy path geared to meeting the needs of low value-added branches, unable in the mid- and long term to sustain development of the country's human resources.

Social partners also made several attempts at investigating demand for vocational training and supply of such services in response to the growing need of their members as restructuring of large State enterprises started to affect their members. While several small projects were undertaken, worthy of special mention is the effort made in partnership between trade unions and employers in the steel industry.

In conclusion, while no systematic approaches have been made and there have been no particular breakthroughs, an important capital of empirical and anecdotal knowledge has been accumulated. On the methodological side, the studies elaborated, though partial and less than impressive in results, have provided a foundation upon which, further, more systematic approaches can be undertaken. The empirical and anecdotal evidence combined with methodological gains from isolated studies have formed the foundation upon which assessments rooted in well-established methods practised in developed economies can start their gradual development.

3. Quantitative versus qualitative approaches in evaluating the demand for skills and vocational training

From the perspective of the training and skills demand assessment process, the period which started in 2001 is highly fertile as it witnessed development of two major approaches, the qualitative, based on empirical studies and the quantitative using macro-modelling and deriving its essence from the 'manpower planning' family of methods and techniques used and subsequently improved in developed economies.

The empirical approach was far faster in gaining ground as it required fewer resources and was considerably more accessible. It was also still the most suitable for the economy's degree of predictability, especially in the early years of the EU accession period (2000-02). The major focus of this approach was evaluation of sector-based demand for skills and training as well as assessment of the state of training supply particularly when the National Adult Training Board (NATB) was established in 2001. It now operates as the national professional qualifications authority, national regulatory body, with a tripartite structure (government, employers and trade

unions). Most qualitative, empirical research undertaken made use of small, non-representative samples, using interview techniques to investigate both demand and supply. However, the samples were designed using the qualified knowledge of experts and researchers thereby yielding valid, relevant results. The validity of these results was confirmed by other related research and analyses which in most cases provided convergent evidence. Further, because they were subject to *ex post* evaluation by stakeholders in the fields they analysed, most studies using such methods have seen most of their conclusions and recommendations upheld and even taken up by respective groups of interested parties.

Quantitative studies and analyses have been rather slow to develop and did not take off until late 2003. The National Research Institute of Labour, with the Ministry of Education benefiting from EU Phare financing (Phare-VET programme), attempted to evaluate demand for vocational training and skills at regional level using a large, representative sample, in a questionnaire survey. Results were analysed by employing methods rooted in the manpower planning technique. This exercise which established regional and local education and vocational training action plans first encompassed only the development regions centre and west. As the output obtained was judged relevant by the Ministry of Education, the exercise was extended nationwide, with final output just being delivered to the ministry.

Methodologically, the qualitative approach has proven useful in probing the state of vocational training and indirectly assessing demand for training. This approach was first substantiated by a nationwide empirical study on the state of training providers, undertaken in 2001, as the first research project of the then newly established NATB. The aim was to provide NATB with useful information on training providers and the foreseeable trends in developing accreditation of these training providers, which NATB had to start. The study had to convert the results of an empirical, interview-based investigation into measurable indicators that would enable NATB to benchmark the performance of training providers in the future and thereby have its future accreditation criteria attuned with the realities of the market. The study shed light upon the demand for training and skills and the different tiers of the market in which different training providers operate which in turn influences the performance and development trends of providers. As such, the study and the method are useful exercises, worthy of regular replication not only for their main purpose but also for assessing training and skills demand.

A major landmark in training and skills demand assessment systems was the development and the subsequent signing by the Romanian government represented by the Ministry of Labour and by the European Commission, of the joint assessment paper (JAP) on employment policies (October 2002). JAP identified training and investment in training as a major challenge for the Romanian labour market and for Romanian employment and labour-market policies. Training was highlighted as an important if not essential tool for increasing competitiveness, mobility and adaptability of the Romanian labour force to meet the employment objectives and targets outlined by the EU Lisbon strategy and fully assumed by Romania as a future Member State. Training and investment in training was highlighted as paramount for the competitiveness of Romanian enterprises and for preserving and further improving their competitive advantages, where salaries and input processes will rise and currency will appreciate thereby denying them their current market strength – low prices. Emphasising these challenges the JAP and its regular progress monitoring has also pinpointed the need for more systematic and adequate assessment of

demand for vocational training and skills for adequate and efficient investment in training and for establishing a viable vocational training strategy.

Elaborating a national strategy for vocational training has demanded a further qualitatively-based exercise to evaluate training demand. The exercise was undertaken jointly, with Phare financing, by the Aarhus Polytechnics-Denmark and the National Research Institute of Labour. It analysed the demand for skills and vocational training, from both the employers and trade unions points of view in two sectors of interest, namely tourism and construction, both fast-growing sectors of the Romanian economy. It was carried out through interviews in selected companies in both industries selected from two development regions, the north-west and south-west. The sample was designed to include major employers and the exercise only reinforced the strengths of the qualitative approach in revealing sector-based trends and needs, adding the distinctive view of trade unions at enterprise level to the vision of the employers. Another novelty of the exercise was validation of its results by means of a parallel survey which focused on the opinions of trade unions at industry and/or regional level. The results of the two studies have been totally convergent, thereby validating each other.

Mention has to be made of the monographic exercise undertaken by the European Training Foundation in Romania. This was unique with its results providing a comprehensive picture of the vocational training sector and demand for its services.

Quantitative analyses as pointed out before only started because of the explicit demand of the Ministry of Education in the framework of its Phare-funded vocational education and training development programme. The exercise made extensive use of an adapted version of the manpower planning technique, substantiated by a nationwide, large sample, representative survey of the training and skills demand of enterprises. Results which aimed at identifying demand for skills at national, regional and industry/sector levels were matched with the forecasts of labour supply and economic development at regional level to assess as accurately as possible the current and forecast demand for vocational training and skills. The procedure was further developed by incorporating elements of a scenario-based macroeconomic forecasting model to increase the degree by which outputs are refined. While some results, especially those that picture demand for training and skills at branch level on a regional basis, may be contested, the exercise is a milestone in Romanian research of the subject, consolidating the quantitative arm of the skills and training demand assessment system.

4. Concluding remarks

Methods of analysing demand for skills and training have evolved apace with the transition process.

As the Romanian economy consolidated its stability and growth trend, the approaches have become more systematic. Growing domestic demand, expressed in the increasing disposable incomes of both households and firms gives a further boost to training, while raising interest in identifying demand for skills, as a way of improving its services and increasing its market share.

Currently two alternative approaches have emerged, following several projects, commissioned by relevant stakeholders and/or public authorities:

(a) one that relies on macroeconomic modelling with its results refined via representative field research;

(b) another, which solely bases its results on qualitative information, drawn from empirical studies.

Recent consolidation of the quantitative arm provides hope that while the national strategy for vocational training is being developed, the assessment system will advance and provide the necessary analytical substantiation that will enable it to be used as a reliable policy-making tool.

As the country has recently turned from a candidate into an EU acceding country (the adhesion treaty signed jointly with Bulgaria on 25 April 2005) both the strategy and the assessment system will become an integral part of a process that will strengthen Romania's capacity of achieving or at least aiming towards the Lisbon goals.

PART IV

Approaches to early identification of skill needs at various levels as an integral part of national systems

This part is based on presentations and discussions at the workshop moderated by Tiina Annus, Praxis Center for Policy Studies, Estonia. The workshop discussed how different levels of identification of skill needs – national, regional, sectoral, company – can complement one another and contribute to the national system. Presentations not only gave specific examples of good practice in identifying skill needs in concrete sectors and occupations but also focused on some more systemic approaches to sectoral and regional analysis. A summary and conclusions of the workshop is provided at the end of Part IV by the workshop rapporteur Joan McNaboe, Skills and labour market research unit, FÁS, Ireland.

Helen Diedrich-Fuhs
**Information system for qualification trends and
developments in different economic sectors in Germany**

Gerd Gidion
**Setting a tradition in motion: modernisation and
establishment of industrial team leader skills**

Pekka Alhojärvi, Annette Munk-Sörensen and Paul Silfverberg
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Information system for qualification trends and developments in different economic sectors in Germany

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This contribution provides information about the system of early identification of skill needs in Germany. In particular, it explains the rationale of the German network on early identification of skill needs FreQueNz. To identify qualification needs at company level the network followed two approaches: a regional approach and a sectoral approach. The German Employers' Organisation for Vocational Training (KWB) participates in the network with the project 'information system for qualification trends and developments in different economic sectors'. The project makes use of complex business networks and puts efforts of various social partners together to improve coordination between employment and training systems. Finally, the contribution makes some proposals for the system of early identification of skill needs in Europe.

1. The importance of early identification of skill needs in the EU vocational education and training policy

Vocational and educational training (VET) plays a key role in achieving targets of the Lisbon agenda. Most EU Member States do not have large domestic sources of raw materials. The know-how of skilled employees is the most important resource and decisive factor for economic performance. To retain this know-how, efficient education and VET systems which take qualification needs into account are indispensable.

The basis and the precondition of a successful VET system is the systematic permanent monitoring of qualification development. It enables timely identification of qualification needs in companies and on the labour market and a prompt response of suitable qualification offers.

Due to accelerating change in companies, the economy and the world of work, which result mainly from comprehensive use of information and communication technologies and globalisation of the economy, early identification of qualification needs has gained much more importance in the past 10 years.

Thus, early identification has experienced a push in importance in recent years; it is the answer of VET to the challenge of global structural change.

Not only for companies but also for society as a whole, early identification of skill needs becomes more and more important. It also becomes a task for the State when labour markets change and unemployment increases due to structural change. In future, employees can no longer expect to work in the same occupation, field of activity and company for their entire lives. Consequently, early identification increasingly becomes an instrument to secure employment, and to reduce and possibly eliminate unemployment.

2. Early identification in the German VET system

By the end of the 1990s – a time in which profound changes in work structures and workplaces became visible – the German Federal Ministry of Education and Research established the early identification network FreQueNz. Faced with the complexity of qualification needs it is not possible to gain all necessary information for the VET system in different sectors, regions and companies by means of one approach or method.

This is why the German Federal Ministry of Education and Research sponsors different approaches by different institutions and actors, whose results are brought together and made transparent. The German social partners' organisations, which have particular experiences, interests and responsibility due to their special responsibility for designing the VET system and concepts, also take part in the platform on early identification FreQueNz.

Since 1998, the German Employers' Organisation for Vocational Training (KWB) as the joint coordination organisation of the German economy takes part in the FreQueNz network in one project. To identify qualification needs at company level the project followed two approaches:

(a)   a regional approach;

(b)   a sectoral approach.

For identifying qualification needs the regional approach focuses on regional consultants in networks of chambers, associations and companies. Thus, it was possible to identify trends in the qualification development in different sectors and fields of activity. However, it is comparatively difficult to provide detailed information on qualification development in national occupations and profiles of further education beyond identifying trends.

This is why we concentrated on the sectoral approach in the second phase of the project.

3. KWB-project 'Information system for qualification trends and developments in different economic sectors'

The central point of the project is a complex business network for the early identification of qualification needs in the economic sector. More than 1 000 experts of chambers and associations are in direct and permanent contact not only with large companies but also with small and medium-sized enterprises. Therefore, the German employers' organisation can make use of a complex network of multipliers.

The project is carried out by KWB, which is responsible for the project management and functions as gatekeeper within the vocational training network of the German business sector, and the Research Institute for Vocational Education and Training in the Crafts Sector at the University of Cologne (FBH), which is responsible for research and implementation.

The project objectives are to:

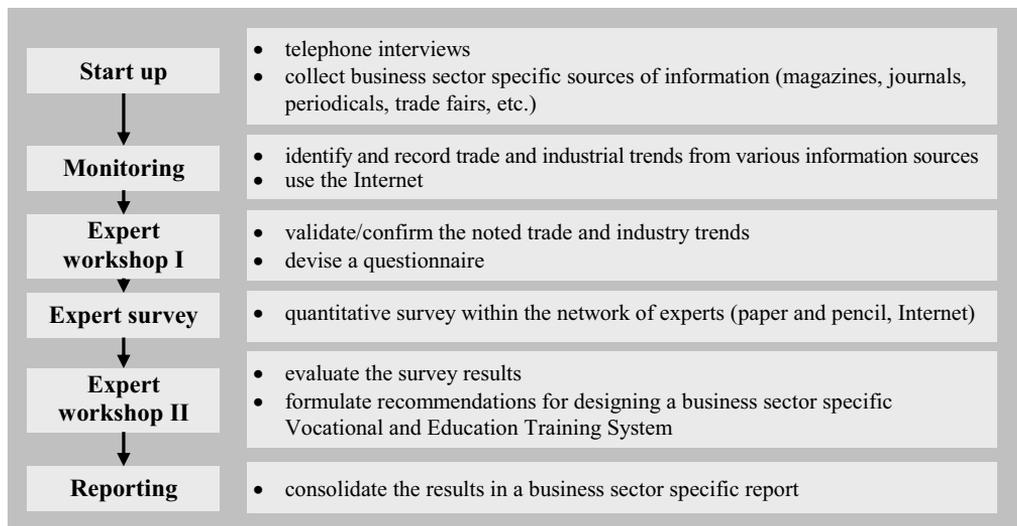(a)   improve coordination between employment and training systems through a simple and flexible information system;

(b) make use of the vocational training network within trades and industries to identify new trends and to determine training requirements;

(c) monitor continually company needs and requirements including those of small and medium-sized businesses;

(d) identify timely innovative market developments and translate them into training and qualification needs;

(e) identify evolving shortages of specialists and skilled personnel in specific occupations;

(f) collaborate actively in the network for early identification of qualification needs (FreQueNz) of the Federal Ministry of Education and Research.

Figure 1: Vocational training network of the German business sector

■ Employers' umbrella organisations
△ Chambers
● Associations
⁂ Companies
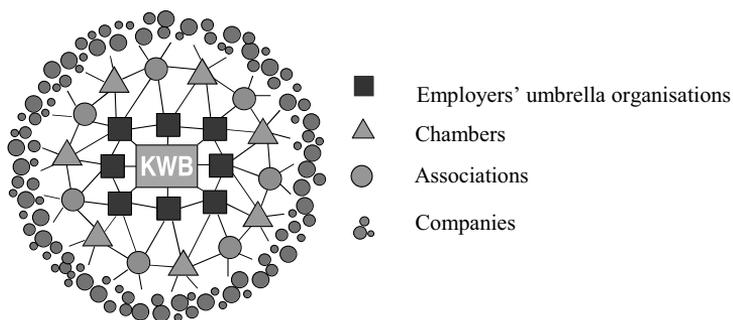
To implement these objectives the Instrument for the continual observation of qualification developments and training needs (IDQ©) was developed.

Figure 2: The instrument for the continual observation of qualification developments and training needs (IDQ©)

Start up	• telephone interviews • collect business sector specific sources of information (magazines, journals, periodicals, trade fairs, etc.)
Monitoring	• identify and record trade and industrial trends from various information sources • use the Internet
Expert workshop I	• validate/confirm the noted trade and industry trends • devise a questionnaire
Expert survey	• quantitative survey within the network of experts (paper and pencil, Internet)
Expert workshop II	• evaluate the survey results • formulate recommendations for designing a business sector specific Vocational and Education Training System
Reporting	• consolidate the results in a business sector specific report

The IDQ$^©$-process provides the basis for the following project products:

(a) trade and industry relevant tools for continual monitoring of training, education and skill development (IDQ$^©$);

(b) information on actual skill needs specific to trades and industries, focusing on trends and making recommendations for training and further education;

(c) information on business sector specific skill shortages;

(d) information on skill developments in training, education and qualification through business sector specific follow-up investigations;

(e) information on identifying training needs of new business sectors.

Since the beginning of the first KWB-project in 2000 some relevant information was gained and introduced to modernise and develop initial vocational training and further training regulations.

Figure 3: Sector specific results

KWB I (2000-01)	**KWB II (2002-05)**
• construction (industry and craft) • print/media ($\Rightarrow$ qualification in media engineering) • electro (craft) • motor vehicle ($\Rightarrow$ reorganisation of motor vehicle occupations) • retail • insurance • construction (repetition research in 2004) • insurance (repetition research in 2005)	• confectioner (craft) ($\Rightarrow$ reorganisation for confectioner occupations) • baker (craft) ($\Rightarrow$ reorganisation for baker occupations) • butcher (industry and craft) ($\Rightarrow$ reorganisation for butcher occupations) • automatic industry ($\Rightarrow$ occupational concept for automation and mechatronic engineers/automation sales managers) • chemistry • office (cross-section) ($\Rightarrow$ reorganisation of office occupations concept) • facility management ($\Rightarrow$ occupational concept for building and facility managers)

4. Experiences, results, and recommendations for EU VET policy: 10 theses for the early identification of skill needs

(a) On the frequently quoted Lisbon goals, for a dynamic and competitive European economic area not only knowledge but complex vocational competences have to be considered, and to acquire them vocational practice is important. This is why vocational practice has to play a central role and social partners have to be integrated. This is the decisive signal for a European VET policy.

(b) To achieve the Lisbon goals, the following are necessary for EU VET policy:

(i) transparency,

(ii) credit systems,

(iii) quality assurance,

(iv) early identification.

Supporting early identification of skill needs should become a central goal of EU VET policy as soon as possible and should be considered in terms of resources, too.

(c) Early identification of skill needs is a decisive precondition for ensuring and improving quality of VET systems.

(d) Therefore, activities on early identification in different EU Member States should be brought together and integrated into a joint network of early identification.

(e) A joint European platform on early identification can give considerable impetus for an adequate and comparable development of VET systems and could have a stronger effect than many other EU activities.

(f) It is crucial for the value and use of results of early identification that the definition of qualification needs does not only meet scientific demands but shows an immediate relation to practice in companies.

(g) In developing a European network on early identification of skill needs, it has to be guaranteed that the results from different countries are identified systematically with scientific and practical criteria. If this is not the case, results are not comparable. Therefore, criteria for such a network should be jointly developed and agreed upon.

(h) It is important for the success and use of early identification that results are considered and used by decision-makers. So, results have to be understandable, practical and widely accessible. This also includes appropriate counselling.

(i) Together with national representatives, Cedefop should follow-up development of a joint network on early identification of skill needs as a priority.

(j) Apart from this, early identification should also be integrated into EU research programmes and VET activities as a priority issue.

Setting a tradition in motion: modernisation and establishment of industrial team leader skills

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This contribution focuses on the changes which the German system of vocational education and training had to undergo throughout the past decade. As a result of various social and economic changes, the German dual system, which is based on cooperation between enterprises and schools, found itself under pressure. Innovations at the workplace are transferred into teaching and learning processes. The actual changes in task performance are translated into new qualification requirements. The contribution focuses particularly on how qualification and training requirements for team leader positions were developed for skilled workers. New career paths had to adapt with a changed role in a different culture of leadership in companies, where the executive becomes more of a coordinator of a group of specialists. The innovative concept to use job-task oriented learning as an innovative process is an example for the upcoming paradigm of professional training in Germany.

1.   Introduction

The German system of vocational education and training (VET) has a long tradition and a very solid and developed structure. There is no lack of regulations, specialities or defined curricula but there is a lack of flexibility, openness for new methods and adaptability. Powerful innovations changed the reality at most workplaces in Germany during the past 10 years. New approaches to organise work in groups, the spread of computer technology and the explosion of knowledge are only three factors that changed the profile of several professions. Further, since unification in 1989, Germany has to cope with two dissimilar parts of the country. All these changes had a serious impact on demands on VET. Since 2000, Germany has faced an economic crisis. The urgency to modernise the VET system is made difficult by ageing trainers. This document is written at a time when the famous German dual system, organised cooperation between enterprises and public schools in the apprenticeship system, is under intense pressure and in constant movement.

In the coming years increasing demand for new qualifications for certain attractive positions in Germany's metal industry is expected. New career paths for skilled workers to achieve team leader positions especially have to be modernised and established (e.g. *Industriemeister*). They need to adapt to a changed role in a different culture of leadership in companies, where the executive is more and more a coordinator of a group of specialists. The concept of using job-task-oriented learning as an innovative process is an example for the upcoming paradigm of professional training in Germany. The German regulation to adjust new qualifications nationwide in interaction between social partners (trade unions and employers' associations) has to prove its adequacy. The adjustment process concerns several professions, regions and sectors and comparisons with other European countries are used. If the solid, tradition-based system of VET in Germany finds a way to open up to the requirements of the labour market, it will be a valuable achievement.

2.   Short description of the German situation

Regular occupational apprenticeships in Germany take place in a dual system. This means that theory and practice (structured knowledge and action-oriented competences) are both part of education, a combination of learning and working aims at an optimal knowledge transfer. Officially and legally any school-leaver can become a trainee in an apprenticeship but actually a selection depending on qualifications does take place (BMBF, 2003). There are national regulations for apprenticeship in organisations and vocational schools, that are coordinated: 'The basis of apprenticeships is an occupational concept: apprenticeship occupations should be orientated at typical qualifications for that job. Within the qualifications that relate to all occupations there is a possibility to specialise although the occupational connection has to be maintained.' (BMBF, 2003). An apprenticeship should prepare trainees for their occupation after education. Willingness to learn and personal development are therefore important for apprenticeship. The aim is that trainees work autonomously, which means they should plan, conduct and control their work processes on their own. 'The aim is employability in a changed working environment, that is not only dependent on technical development but can also be formed by working people. That is why State-approved apprenticeships and federal regulations for further education examinations are developed in consensus with social partners.' (BMBF, 2003).

Regular apprenticeships have a defined content and take place during a certain agreed time (normally about 42 months) through an interplay between the organisation and the vocational school. The duration of an apprenticeship depends on the occupation but lasts between 24 and 42 months (apprenticeship regulations quote an average of 37.7 months but actually it is about 35.5 months because of regular shorter periods). There are around 345 accepted apprenticeship occupations but they are not equally occupied: one third of those enrolled concentrate on the first 10 occupations, mainly commercial-technical fields and trades.

2.1.   Type of occupation or job people enter upon completion of their training

During the past 14 years the process of 'tertiarisation' (increase of the service sector in relation to the decreasing production sector) has been overlapped by change of the economic infrastructure in the new *Länder* (former GDR, eastern part of Germany) after unification in 1989. So, it is necessary to distinguish between development in the old and new *Länder*. At the end of the 1990s about two thirds of the people in both parts of Germany worked in service professions, especially in administrative jobs, the health sector, education and commerce. One third was employed in productive and technical jobs, and the primary sector had only little importance for the German labour market (compared to other European countries). Many people do not continuously work in their learned profession. They switch to similar occupations, where it is not required to have special knowledge but only to have completed any apprenticeship. In the long run there is a stable trend of increasing demand in intermediary occupations. There are fewer jobs for unskilled workers. The growing segments are higher qualified positions and specialised service sectors. The labour force divides more and more into performance-oriented employees and a smaller group of less competitive persons. The process of adaptation between offered and actual apprenticeships and the labour market shows this. Over several years juveniles have shown a preference for some professions, especially motor vehicle mechanic (male) and hairdresser (female), although there is a significant leaving rate in the first years after finishing the apprenticeship. On the

other hand there is a tradition of vocational training in certain companies and sectors, so they continue to offer more places for learning than jobs afterwards.

The total number of students enrolled in the vocational education system in Germany is about 600 000 per year. They are trained in 23 % of the 2.1 million companies in Germany that offer apprenticeships or vocational training. Participation differs by the size of the companies: 16.5 % from the 1.35 million companies with 1-9 employees offer training; in companies with 10-49 employees (255 000 million companies) the percentage is 46.9 %. In the group of 62 000 companies with 50-499 employees 70.1 % offer training and the 4 000 companies with more than 500 employees the contribution is 93.3 % (BMBF, 2000).

3.   Training for the German manufacturing industry

The change in work requirements over the past 10 years had a new dynamic and was discussed extensively. For example, five major developments formulated 10 years ago and referred to in *Production in the 21st century* (Lutz et al., 1996) are still important today:

(a) a decentralised/local organisation with augmented responsibility on the job (an expansion of profit centres, group production, flatter hierarchy structures, 'modular organisations', 'fractional structures', customer and market orientation);

(b) improvement of cooperation between fields, departments and organisations (simultaneous research and development; integration of planning and execution; inclusion of suppliers and future users in product and system development; strengthen the innovation potential of SMEs);

(c) development and full utilisation of the abilities and the potential of subordinates (long-term considerations of personnel development and further education; learning content such as internationalisation; goal oriented creation of learning possibilities on the job);

(d) environment protective operations in circuits (product-integrated environment protection; intersectoral logistics, product development in a holistic and recycling way);

(e) globalisation of German product strategies (integration in worldwide development associations; systematic use of production locations abroad; placement of German production locations in global networks).

The BIBB/IAB study ([49]) analysed changed requirements in special occupations. Respondents filled in a list that asked for the frequency of requirements in their job.

Within occupational science (e.g. the IAB) the different requirements of occupations are sorted into two groups. These groups refer to abilities and characteristics and to knowledge and skills respectively. Abilities and characteristics are the capacity to see, to see colours, to distinguish colours, to perceive correctly; spatial sense; appreciation for colour and shape; creativity, adroitness, dexterity, physical strength; drawing skills, written and spoken expression; planning and organising, calculation, adapting to changing tasks; empathy, interaction with other people, secrecy, discretion, negotiating skills; cohesive thinking, imagination, improvisation; willingness

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([49]) IAB, 2001

and capability to work in a team, willingness and acceptance to work alone; to bear stress and work peaks, vigilance and reaction speed, hardiness, patience and good appearance.

Knowledge and skills are advertising, public relations, market occupational certificates, presentation of goods, decoration, presentation; purchasing, acquisition of commercial knowledge, cost accounting, costing, calculation sale; occupational organisation, office organisation planning and preparation of work processes, work studies concerning control, evaluation of work outcomes, quality assurance; communication: customer counselling and support, leading discussions, leading subordinates, training skills, foreign languages, technical design; setting and use of conventional machines, systems, putting up, installing and initiating machines, systems and plants; repairing and refurbishing including a course analysis of an application and maintenance of machines and plants; application of computer-based or computerised machines and plants; application and maintenance of conventional machines and plants, production and assembly with computerised machines, systems and plants; metal machining and processing; plastic machining and processing; wood machining and processing; restoration; refurbishing, preservation, reconstruction, shape and colour creation in traditional technology; use of computing in the building industry, the analysis, computing application; modern office technology, office communication; text processing with computing typing methods, stenography; correspondence; creation and optimisation of CNC-programmes; designing with computers; technical drawings; building technical material; computer aided technical drawing (e.g. CAD); conventional and computer aided construction drawings; conventional application of computing in the medical and diagnostic area; knowledge in: alignment and product; drugs; health, medicine, personal hygiene, building materials, goods, basic materials, materials, electronic, micro processing techniques, dampness, heat and sound insulation, measurement and control technology, hydraulics and pneumatic; specialised regulations, personnel and welfare, taxes and insurance, safety at work, accident prevention, environment protection, ecology; material and administration of inventory.
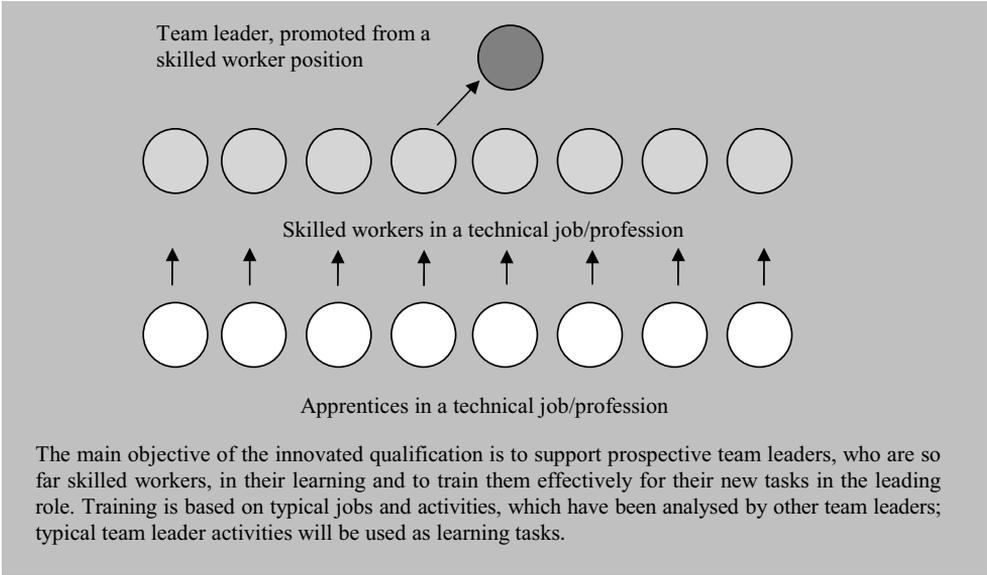
Changed requirements can be found in every occupation. IAB created a specification of demands for actual occupations. Different occupations consist of different constituents and therefore differ in their degree of strain: accurate accomplishment of precisely defined tasks, permanent repetition of work processes in detail, accurate observation of processes, accurate specifications in quantity and working time, extreme deadline and performance pressure, high strain until the edge of productivity, simultaneous accomplishment of different jobs or processes necessary, existing risks of larger financial losses also at small mistakes, often interferences at work, daily confrontation with new tasks, specified necessity to accomplish untrained work contents and the expectancy to improve existing work processes or to use new strategies during the job. Specialists in construction and wood technology, in metal and electrical engineering and also in the agricultural sector are burdened most through changed deadlines and performance pressure. Accurate accomplishment of precisely defined tasks is primarily a strain for people working in the textile industry whereas permanent repetition of work processes in detail is especially relevant for the nutrition and domestic sectors. New tasks and improvements are mainly demands of electrical engineering, and interferences at work for office professions. Simultaneous accomplishment of different jobs or processes is a burden for people working in the nutrition industry, whereas large financial risks caused by small mistakes mean strain for employees in the metal industry.

In most occupational activities in industrialised countries (Troll, 2000), computerised work equipment is used which has an important influence on this area. Generally, work demands differ with the complexity of computer usage: high demands (e.g. programming or specific use of CAD, CNC, calculations, web design, etc.), medium demands (e.g. working activities that are part of network processes, or the operative use of programmes such as DTP ([50]), SAP ([51]) R/3, etc.) and low demands (e.g. release orders of data, the simple entry of data into templates and simple information research).

3.1.   Progress from craftsperson to *Meister*

As 50 % of trainees in the craft trades sector are general secondary school-leavers and only 4.6 % hold a university entrance certificate, the craft trades have for many years made greater efforts to motivate high-achieving school-leavers to start vocational training. In addition, about 150 000 businesses in the craft trades sector alone will change hands in the period up to 2007 as current owners retire. Consequently, the craft trades sector needs adequately qualified manpower to take over and successfully manage these enterprises in future. The craft trades sector is trying out new approaches to persuade high-achieving young people to undergo training in craft trades and to motivate experienced journeymen (*Gesellen*) to enrol in appropriate courses to upgrade their qualifications. To this end, the structure of continuing education and training was modified and access modularised – for the time being on a trial basis. The traditional career concept in the craft trades – from journeyman (*Geselle*) to master craftsman (*Meister*) – was extended to include another two levels. Based on existing training qualifications, it now comprises three levels of continuing education and training which build on one another: intermediate-skills level, the *Meister* level and the *Meister*-plus level.

Figure 1: Learning support for prospective team leaders

Team leader, promoted from a skilled worker position

Skilled workers in a technical job/profession

Apprentices in a technical job/profession

The main objective of the innovated qualification is to support prospective team leaders, who are so far skilled workers, in their learning and to train them effectively for their new tasks in the leading role. Training is based on typical jobs and activities, which have been analysed by other team leaders; typical team leader activities will be used as learning tasks.

([50]) Desktop publishing prepress.

([51]) Systems application and products in data processing.

Courses for the latter are usually provided by craft trades academies. In view of emerging changes in the craft trades sector such as buying services by one-stop shopping it is inevitable for master craftsmen to concentrate on business management to be able to extend the range of services provided and comply with customer wishes in an individualised and customised fashion. It is therefore necessary to delegate certain defined tasks to adequately qualified staff, thus creating new positions at a level between journeyman (*Geselle*) and *Meister*.

Meister qualifications are at the heart of continuing VET. They are still the *sine qua non* for managing craft enterprises and training apprentices in the craft trades sector. Pursuant to Section 46(2) of the Crafts code the continuing VET course leading to the *Meister* diploma consists of four separate modules with examinations which may be taken as independent exams at different times. The modular upgrading concept is designed to ensure that upgrading courses permitting progression to middle management are increasingly devised to ensure credit transferability to parts of the *Meister* diploma. This has already been implemented in the inter-trade upgrading training course for trainers whose credits are transferable to Part IV of the *Meister* examination, and in the 'technical specialist' course which is credited to Part III of the *Meister* examination. As far as the trade-specific parts are concerned, the central trades associations are called upon to devise appropriate upgrading training modules which permit the transfer of credits. The 'customer service engineer automobile' training module was the first trade-specific upgrading training concept recognised and credited to Part I of the examination for *Meister mechanic*, automobile. In addition, *Meisters* and skilled personnel holding management and senior positions in craft or similar enterprises can avail themselves of attractive upgrading courses run by craft trades academies in postgraduate study courses. Such courses include, for example, business specialist at *Meister* level (in the craft trades sector), restoration specialist in the craft trades sector, designer in the craft trades sector and energy systems consultant in the craft trades sector. There are already training courses that prepare for such middle management functions; they are either one-dimensional or multidimensional. One dimensional continuing training courses focus on a specific function, for example, technical specialist (in the craft trades sector), trainer (in the craft trades sector), customer service engineer, automobile, or customer service engineer, heating and ventilation facilities. Multidimensional continuing training courses focus on several functional areas or cross-occupational functions. They include, for examples, business specialist (in the craft trades sector), specialist, facility management (in the craft trades sector), customer service engineer, facility management, and construction site foreman.

Most *Industriemeister* (team leaders) in the metal industry are from the mechanical engineering or the automobile sector. They have mainly a locksmiths or mechanic background. The positions and tasks of the *Industriemeisters* can vary to a certain degree depending on how much demand for leadership there is in their job. They can have tasks with few or many aspects of leadership. Table 1 shows the different tasks and positions a team leader can have.

The table describes three different levels that can all be assumed by a team leader. The skilled worker position mainly comprises technical tasks and no leading tasks. The typical team leader role is characterised by organisational and leading aspects. In between, there is a team speaker position, who mainly has technical tasks but sometimes has to manage leadership aspects too. In Germany some team leaders in the metal industry are nominated by their organisations because they have special skills. Mostly, however, they have to pass a special exam to work in that position. Before they can take part in these examinations they either have to finish an apprenticeship in the

metal industry and have one year of work experience or finish an apprenticeship in another section with three years work experience or, as a third possibility, they can take the team leader examination with no apprenticeship but six years of work experience in the metal industry.

Table 1: Overview of possible positions demanding leadership skills

Position \ Task	Technical task ([1])	Technical task with group role	Technical task with leadership tasks	Formal leadership role with responsibility	Leadership of leaders
Position based on a formal assignment within the hierarchy	Technological expert, investment organiser	In the group integrated and formally assigned quality manager	Collaborative head of an external service action (e.g. assembly of a line abroad)	Team leader of a certain section with output- and personnel responsibilities	Head of a section with several other team leaders
Position based on a nomination without a certificate	Production scheduler, work planner and customer consulter	Skilled worker with team speaker ([2]) responsibilities	Skilled worker with group leading responsibilities	Team leader of a time, place or content separated group	
Position based on a personal specialisation	CNC-programmer, 3D Measuring machine user	Skilled worker with special tasks within the group	Skilled worker with a temporary project leading function		
Basic position	Skilled worker	Adjuster, quality manager, computing agent			

([1]) Task based on skilled knowledge.
([2]) Those with a position between the team leader and the team. It is their responsibility to communicate matters of the group to the team leader.

In 1997 the examination regulations for team leaders in Germany were divided into three parts (Table 2).

The content of the exams, and therefore also the training, was designed by representatives of the German Chamber of Commerce, the IG Metall (the German metal union) and others. The content was not designed in a very detailed way so trainers were still free to create training individually. The first big block of the exam is part of the interdisciplinary basic qualifications. Members have to pass a written exam and training for the exam is traditional: trainers, as experts, teach members in a certain area, members have to listen to the trainer and learn for the exam. This is also what training was before the new examination regulation. Within the changed regulation a new part called 'activity specific qualifications' was created, which also had implications for training methods. The new examination as well as the new training methods were based on a new paradigm of learning. All taking part in the examination (members, trainers, examiners, etc.) have had to change their way of thinking so the new form of learning could be implemented.

Table 2: Components of the new examination for team leaders in the metal industry

1. Pedagogical qualifications (instructive competence)

2. Interdisciplinary basic qualifications:

(a) knowledge of legal situation,

(b) business management,

(c) application of information, communication and planning methods,

(d) cooperation within the organisation,

(e) consideration of natural science and technology.

3. Activity specific qualifications:

(a)	technology	(i)	operational equipment,
		(ii)	production engineering,
		(iii)	assembly technique;
(b)	organisation	(i)	business economics and cost management,
		(ii)	systems of planning, controlling and communication,
		(iii)	occupational and environmental safety, health protection;
(c)	leadership and personnel	(i)	personnel leadership,
		(ii)	personnel development,
		(iii)	quality management.

Figure 2: Relevance of different topics for training team leaders evaluated by prospective team leaders and involved trainers (2002)

Trainers (n = 95)
Students (n = 312)
1 = not trained
6 = very intensively trained

Topic	Trainers	Students
Implementation of teamwork	3.46	3.63
Delegation of responsibility	3.12	3.62
Continuous improvement process	3.44	3.11
Projects of innovation	3.30	3.02
Organisation of the order pool	2.59	2.98
Cooperation with other departments and external partners	3.03	2.88
Documentation of agreements and contracts	2.88	2.65
Participation in acquisitions	2.03	2.49
Realisation of long-term activities	2.22	2.37
Negotiations with different people	1.95	2.20
make use of of information technologies	2.14	1.99

Source: Survey, 2002.

The main focus of the new paradigm is to create specific tasks, that are concordant with the daily tasks of the team leaders. The aim through both the examination and training is to prepare future team leaders for their daily work which can only be done by specific situation tasks. To change

from a skilled worker to a professional team leader requires not only a certain amount of knowledge but also personal development. The idea behind the new kind of training is that learning in a setting similar to the working environment improves learning processes. Studies on learning at work confirm that learning with a content that relates to specific working activities is better than theoretical training. The content of such training is more easily transferred to new tasks and a broader comprehension can be gained. The qualifications were taught with specific situation tasks gathered in specific projects. Situation tasks comprise descriptions of a typical team leader work setting and a specific task relevant to it. This shows the emphasis of the exam and training: to train the competences necessary for the exams and those necessary for the future job as a team leader. This new kind of learning is called 'action-oriented learning' or 'situated learning'.

There are several elements of how action-oriented learning is organised:

(a) complete job tasks (that means the tasks should contain autonomous goal setting, planning, choosing tools to implement goals, goal implementation and control);

(b) self-organised learning processes of learners;

(c) orientation of training towards the interests, knowledge and experience of members;

(d) reflection on the tasks and learning processes.

Figure 3: Action-oriented learning
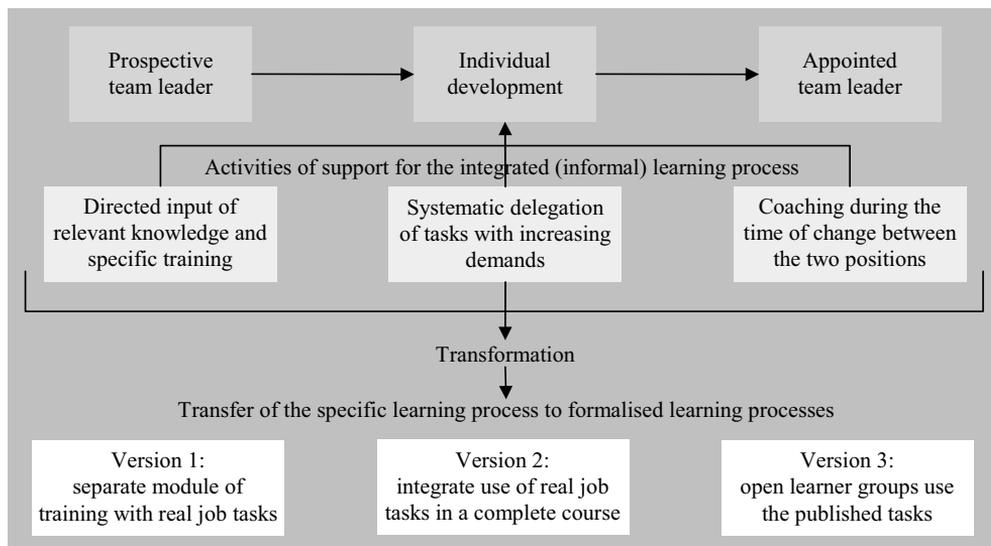
Not only did the way of learning change through the new paradigm, but also the role of learners. They are no longer passive learners but active learners who have to show personal initiative. The aim of the German initiative was to gather situation tasks that represent typical tasks of team leaders by cooperating with several companies. Through an investigation of the work assignments of team leaders, situation tasks were derived. Cooperation between members, external trainers and company trainers, authors of literature and papers relevant for examinations and examiners themselves was developed. With trainers, the whole concept, situation tasks

(which tasks for which training) and details of the training were planned. The learning material and material for trainers were developed by researchers, trainers and experts. Members were also asked about their initial situation and interests at an early stage. When training and examinations were first conducted, evaluation at the end played a major role in defining what should be altered. One year later there was a second evaluation to ensure optimisation. According to the new learning paradigm the examination and training were designed as well as instructions for members on how to learn on their own. Of course the situation tasks were also adjusted accordingly.

4. Innovation and change processes

Consequences for occupational practice emerge from the changed work requirements. They cannot be transferred directly to specific occupations and training regulations because they have an effect at several levels.

The first level contains the basis of general occupational behaviour. Essential requirements for people working in organisations have changed compared to the past. They have to work in complex, dynamic systems under their own responsibility. Orientation in complex systems as well as working with computers and use of time management, quality systems and costing development is expected from every employee. There are no longer many tasks for demotivated people.

The second level goes beyond single occupational fields. Some strategic changes are relevant for more than one occupation, for example acquisition, documentation and control procedures in distribution processes. They refer to cooperation between several special disciplines and product branches as well as the splitting and coordination of smaller organisational units. In this sector a new form of occupational cooperation is necessary which embraces, for example, people working in manufacturing, commerce and delivery services.

The third level comprises single occupations. The skills acquired in existing occupations comprise numerous constituents but are not sufficient in practice. The grouped occupational titles can be modernised with new elements and consequently can be implemented. Disadvantaged groups can be promoted and qualified in these occupations.

These three levels are subject to educational regulations. The following levels 4 and 5 contain specialisations with no legal regulations.

The fourth level is formed in occupational specialisations. Occupational specialisations evolve within several branches. For example, in addition to transport tasks with technical goods, service tasks for customers can be new in a job. Numerous occupational specialisations are frequently designed and realised in a modular way on the level above single occupations. This can either take place during education or during systematic further training.

The fifth level is the territory of organisational specialisations. They can be found in every work system. It is normally hard to identify special characteristics and consequently to deduce professional support for subordinates. Organisational specialisations comprise an indication of

possible future general qualification requirements without offering precision of their spatial dispersion.

If work requirements are considered from an organisational point of view, the fifth level has to be considered. This is where on-the-job requirements evolve, which can be examined by types of occupation.

The process of modernisation of a VET system is usually driven by changes and innovations at work; defining the contents of apprenticeship follows the reality of the job. A second driver can be new findings or concepts as a result of scientific research and development. A third influence comes from processes of social evolution (such as the average standard of education) or political decisions (such as integrating environmental protection into several curricula). Finally, teachers can generate modernisation themselves. Modernised training has an impact in the opposite direction, because the trainees work in these fields afterwards.

Figure 4: Factors and path of innovation in the VET system
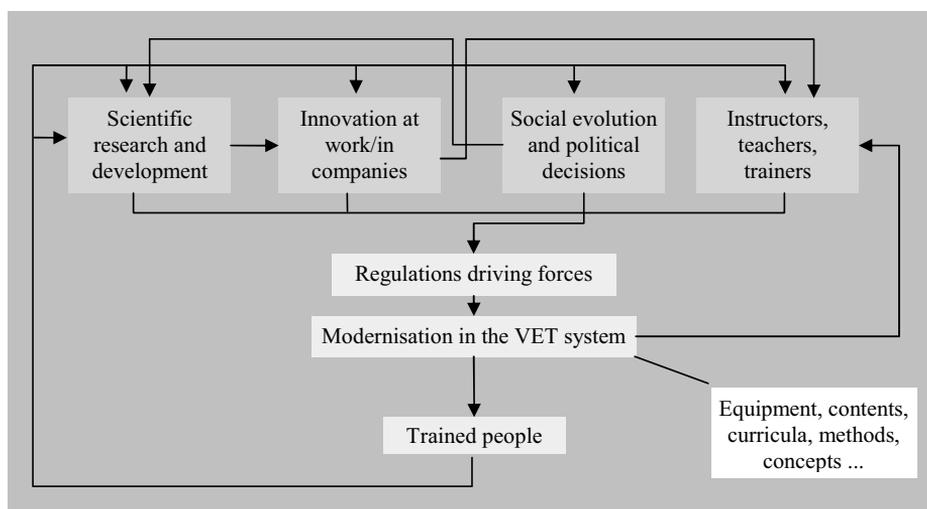
Retraining instructors and teachers is not statistically reported in detail. Training teachers is decentralised and a separate responsibility of the *Länder*; retraining instructors is the responsibility of companies. Local and regional initiatives and continuous cooperation are often organised and reported in several publications. There are possibilities for time-off from teaching for teachers to gain experience in industry to keep up to date with production methods, but this is usually the responsibility of an individual school and company. The process of acquiring the latest technologies is similar: besides direct investment from public funding there are several gifts or loans of advanced equipment for teaching purposes from capital goods producers. Advanced equipment in firms is also used by VET teachers to train their students. In new professions there are special investments in school equipment. Recently schools have had increasing problems with budgets and investments, so a demand backlog can usually be found.

In Germany an increasing percentage of learning takes place directly at work, for example as self-initialised experiential learning (45 % of all employees experienced this learning in 2001), reading relevant literature and periodicals (44 %), short seminars, lectures (34 %), instruction from colleagues (31 %), relevant congresses and fairs (23 %), visits to other departments within the company (11 %), quality-, shopfloor-, learning-circles (8 %) and exchange programmes between different companies (3 %) (BMBF, 2001). This change of relationship between formal and non-formal professional learning might have an impact on teachers training too.

Different arrangements of combined production and training units can be found in companies. Still common is the detached training centre in a separate building. Sometimes training rooms are located close to the production system and both units have continuous interaction. Sometimes the training unit is directly integrated into the production system (e.g. as a learning station). In a fourth variation learning and working is completely combined, so knowledge and training support has to be offered during the working process. Theoretical teaching at school is open to new methods such as learning in practical projects.

Figure 5: Variations to combine production and training units in the German VET system
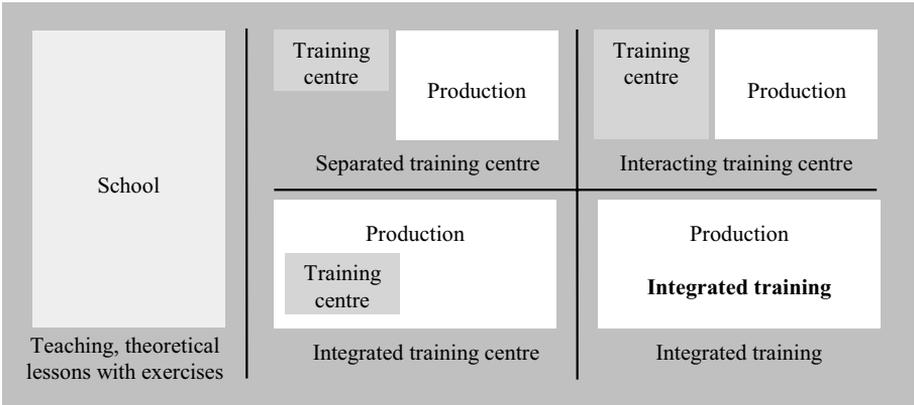
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Training needs assessment in development activities in the Russian forestry sector

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This contribution discusses lessons learned in some development programmes and projects funded by international, European and bilateral donor agencies in the Russian forestry sector. Most projects are planned and implemented without proper identification of skill needs according to sector development. Yet most projects comprise educational or training components aiming at improving knowledge and skills of employees at different levels in forestry sector organisations. One may conclude that without basic analysis, or assessment, the results and impacts of such educational or training efforts remain low. So far the training needs assessment has been implemented in bilaterally funded development projects. The assessment has usually been implemented at enterprise and sector levels without links to other sectors, or with general skills identification processes. Particular emphasis should be paid both to improved skill needs assessments and strengthening relevant educational structures at regional and local levels. These development efforts propose coordinated activities including planning and cross-sectoral projects between relevant ministries, coordinated planning and shared experiences between donor agencies, and development of links between working life and employers as well as educational institutions.

1. Working life development in the Russian forestry sector

1.1. Overall development

One can identify certain overall trends in the development of Russian working life. They deal with the relationship and division of work between the public and private sectors and organisations acting in them. The overall trend is that formerly publicly organised activities are increasingly carried out by private companies and other organisations. In the forestry sector, forest harvesting is an example of such activity as the roles and functions of forest management enterprises (*leskhozes*), and the forest harvesting enterprises (*lespromhozes*), have been and are in transition. The former are currently actors of the public sector, the latter of the private sector. After the reforms of the Forest Law, some functions may be transferred from the public to the private sector, and the remaining functions in public enterprises are likely to be assessed in a more business-oriented manner.

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The other major trend in approaches to modern working life is transfer from production oriented work to client/market oriented work. This means that increasingly products and services provided are planned and manufactured, produced according to the needs and requirements of clients, instead of producing products for storing and then selling when a suitable opportunity arises. This trend also emphasises the need to satisfy the quality needs of the client, and is replacing quantity-dominated activities in working life.

1.2. Development of working life in the forestry sector

The Russian forestry sector is increasingly following the trends and requirements applied in foreign markets and other international trends described below. There is a strong willingness to develop full production chains instead of optimising only parts of production. One hindrance has been the low rate of private ownership in forest related activities, and for instance, that it is impossible to take care of the full production chain from seed in regeneration activities to marketing final forest products. In modern forestry in other countries which are major competitors to Russian companies this has been the leading principle for decades, if not centuries. The main factor fostering this process in Russia is the need to certify Russian forest products in selected western European markets. It is still difficult to verify the full production chains of forest industrial products, in Russia. This is because seldom, if ever, is the same producer responsible for the full production chain so the sustainability of the chain can be verified.

This approach implicitly means that modern forest employees at all levels must understand their part of work and its importance in the scale of the whole production chain. Instead of educating forest employees in certain occupations, they should have skills and knowledge to understand more comprehensively the whole production chain and their own and their colleagues' roles.

The key function for developing Russian forestry to meet international standards can be found in forest management planning. It has gradually moved towards so called landscape ecological planning in neighbouring countries through which forest harvesting planning can also be integrated into forest management planning and towards using softer and simultaneously more intensive forest management practice, for instance by improving and increasing use of thinnings. It integrates silvicultural activities and road construction under the same planning umbrella providing models for increased involvement of biodiversity and recreational values in the planning process.

There are only demonstration areas, usually under themes of 'model forests', where such approaches have been tested but evidently these tests and experiments will become more common in future. These improvements and changes recommend changes in the normative base of forestry and changes in forest management principles. But as modern forest policy and improvements in forest legislation and regulations continue, for instance the Pskov Model forest experiences will be transferred to *oblast* level from district level, future forestry sets new criteria for Russian forestry sector employees .

New types of intensified forestry also require new types of forest harvesting systems and techniques, and technologies. Particularly thinnings require lighter and more ecological methods for harvesting. Increases in thinnings and the further mechanisation of forest work set

new criteria for knowledge and skills for forest machine operators, foremen and planners. At the moment the bottleneck is in curricula of forest machine operators which do not exist in Russia for modern forest harvesting machines using the cut-to-length method. Forest harvesting and industrial companies increasingly purchase and use modern forest machines, but without proper training for operators. Operators have to be trained in Nordic countries or increasingly in the Baltic States as there is no such training curricula and longer courses for operators in Russia. The situation is not sustainable. Forest machine operators for Russian forestry should be trained properly in Russian conditions, primarily by Russian trainers.

The same bottlenecks exist in wood processing. Most colleges and schools for woodworking collapsed or were closed during the 1990s and new workers have seldom acquired basic education or training for their occupations or jobs. Not only are the technical skills poorer than they used to be among older workers, but also social and health related factors and ergonomic ones are less taken care of than earlier. Numerous field visits during preparation of the World Bank's sustainable forestry pilot project (SFPP) have proved that the skills and circumstances in wood processing entities are at much lower levels than they used to be, for instance in the 1980s.

Additionally, evaluations of Finnish-funded forestry sector educational projects in north-west Russia proved that education and training facilities were at very poor level in vocational institutions, and could not provide appropriate training for future or acting workers in the 1990s. Employers prefer nowadays to apply on-the-job training instead of using educational institutions for forest industries.

The situation is not sustainable either. The only permanent and sustainable way to provide future professionals at all levels for Russian forestry and the forest industry is to invest in human resources development, and that starts by investing in education and training institutions. The main criterion should be that these institutions meet the needs and requirements of the Russian forestry and forest industries that need active and productive staff with modern approaches, methods and skills in their future occupations. The first step has already been taken as colleges and schools are increasingly using computers and various simulators for practical training, but modern technologies and trainers for them are still missing in these institutions.

One option could be to integrate enterprises and practical training more thoroughly, as was common practice formerly. Nevertheless, education and training institutions should not be dependent on this relationship. They should be able to procure basic technologies by themselves. This can be done, according to the experience gained in preparing the World Bank SFPP, with strong support from regional administrations and particularly those responsible for forest and education sector development. This also includes budget allocations for such basic investments.

The main bottleneck at the moment and the decisive factor for future Russian forestry sector development, is the lack of qualified human resources in all parts of the production chain, and at all levels of employees.

1.3.   Development of work

To be able to foresee the development of future professions and occupations one has to find out the views of employers active in different parts of working life, covering all the main production chains, and main parts of the these chains. As the role of recreational functions and

use of non-wood forest products evidently increases, according to international experiences, it is also vital to foresee changes in those fields. National parks and other nature conservation areas will increasingly provide employment for professionals, as well as through private companies, mostly small- and medium-sized enterprises (SMEs).

Owing to international trends some forestry functions will be integrated into certain job categories and some jobs will be eliminated as a result. For instance, often foremen are replaced by workers with increasing responsibilities and functions, and partly by specialists. Workers plan more and more of their work as their knowledge and skills improve and their level of expertise is heightened by new curricula and further training. Alternatively, some workers are replaced by machines. This has been generally the case with forest workers where chainsaw operators have been replaced by harvesting equipment.

As a whole skills and knowledge required and needed in future occupations and professions will be different from nowadays. How different and in which directions they will develop should be determined to plan education and further training according to future needs, both in quantitative and qualitative terms. Additionally this information is needed to plan future employment policies as these changes and reforms are at least to some extent structural by character and employment policies should react in advance and become active as a whole as these changes usually create increased unemployment.

In many countries there is a tripartite system where government, employers' and trade unions' representatives discuss future employment and general and sectoral working life development. They discuss implications for future professions and occupations, and the need for academic and vocational education. This system has been applied in Nordic countries for decades and it helps, for instance, in concrete planning of the forestry sector, and its educational segments. As it is not applied in the Russian Federation the most relevant way to foresee these changes and be able to plan human resources development is to use training needs assessment (TNA) and other methods of early identification of skill needs in working life. Unfortunately TNA has not been commonly used, although it was approved as an approach and a method by the World Bank SFPP in preparing the regional part of the World Bank loan.

2. Training development process in an externally funded development project in the forestry sector

Use of TNA or another method to identify skill needs for the future should always be a part of a systematic educational development process, preferably an elementary part. Owing to experience gained mainly in countries with economies in transition a recommendable structure of such a process is as follows:

(a) training personnel to carry out TNA;

(b) planning TNA;

(c) data collection at various levels of employees in selected enterprises and stakeholder groups;

(d) analyses of the findings and results of TNA;

(e) comparison with present curricula and educational and training programmes;

(f) design of training programmes and modules, etc., including materials and recommendations for revising educational programmes;

(g) selecting trainers;

(h) training trainers;

(i) training some pilot target groups;

(j) planning follow-up of the training process.

In externally joint funded processes there is another phase which typically is easing provision of training, carried out by the training institutions themselves, with trained trainers acting as focal points within their core areas of expertise. This implementation phase is mostly funded by the client country itself, and sometimes with joint funding identified during the educational development process.

It is often sensible to train trainers from other relevant organisations such as enterprises involved in practical training phases because of their facilities, technologies or expertise used for developing production chains. This is also the case in most Russian education institutions as they still have a complex framework and are typically not yet prepared for fast development processes.

3. Approach to training needs assessment

The basic theory of TNA carried out in north-west Russia is shown in the Figure 1.

Figure 1: Training needs assessment
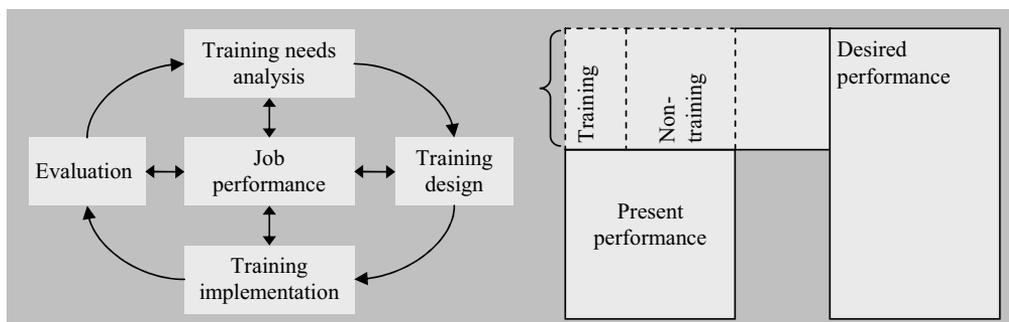
The left part of the figure shows that identifying training needs should be closely related to job performance (as should planning and implementation of training), and the right part of the figure shows that improvement of job performance is not only related to training received but also to other non-training factors (e.g. change of management, procedures, technology, etc.).

Job performance is understood to be the way jobs are performed; what people/units/organisations are doing and achieving. Desired performance is understood to be the performance that organisations expect their employees to achieve.

In addition to these figures describing the basics of TNA, training will only be successful if employers and trainees find the training relevant. If training is not found to be relevant, trainees

will not learn and employers will not be willing to send staff for training. Therefore, identifying training needs must be based on analysis of present problems in forestry organisations and discussion with management and staff in these organisations about problems they foresee in the near future. Expectations of future development in both local conditions and trends in the international market and forestry would be considered.

It is important to look at existing problems and challenges as foreseeing future training needs should not only be based on the difference between present needs and future needs, but should also look at present needs, as often these are not met fully by education and training institutions. This is of particular importance in countries in transition as development in all sectors is much faster than development in education and training institutions. There will always be a certain level of delay in developing training, and the faster the development in society the greater the distance between training institutions and industry.

When identifying training needs it is also important to look at both qualitative and quantitative needs. Qualitative needs are needs described in terms of desired performance in such detail that trainers are able to develop training based on it. It is not enough to talk about job categories; it must include the tasks and responsibilities of these jobs based on actual experience of staff in present jobs and from specialists/consultants/jobholders having practical knowledge about tasks which will form elements in future jobs.

3.1. Planning TNA

When planning TNA it is important to consider the nature of the industry in question as well as the consultants who will carry out TNA. Many tools can be used, but consultants must feel comfortable with the application of these. Therefore, it is important to develop a plan for TNA simultaneously with training TNA consultants as they will carry it out.

It is important during TNA not only to consider the opinions and knowledge of management, but also to talk to staff at all levels. Development and adaptation of new trends often takes place at all levels in an organisation. In addition, management seldom know about all the problems and difficulties at lower levels in organisations.

4. Skills profiles as tools for institutional development

4.1. Skills profile system

Definition of the objectives and priority tasks of an organisation and its various staff categories is essential for all institutional development processes. Jointly shared objectives ensure objective-oriented management, and prioritisation ensures efficient use of an organisation's human resources. When the objectives and tasks are clear, the nature and level of skills required at different units and staff categories may also be clearly and concretely defined. This, in turn, enables comparison between the required skills and knowledge and actual performance, whereby institutional development needs may be identified and relevant measures planned.

The system of skills profiles is among the most practical and efficient tools for planning and managing institutional development processes. The method has been utilised both in public

and private sector organisations. A skills profile defines the specific skill areas and levels needed in an organisation/unit/staff category, or even for an individual staff member. Thereby, it concretises the organisation's objectives into practical tasks and skills at various levels of the organisation. The skills profile may then be used for defining training needs as well as for identifying other institutional development measures.

Typically, a skills profile may be presented as a matrix including 4-6 basic skill areas and 4-5 skill levels. In its basic form, a skills profile matrix may include the following definitions (Table 1).

Table 1: Example of a skills profile matrix

Skills required in the respective task	The level of required skills			
	No skills required	Basic knowledge	Professional knowledge	High expertise
Strategic skills (e.g. skills and knowledge related to the organisation's strategies and objectives, or wider policy frameworks)				
Substance-related skills (professional expertise)				
Tools-related skills (methodologies, working tools)				
Communication, leadership and management skills				
Learning skills				

Each skill area may be further broken down into 5-20 detailed skill areas. The idea is to define the required skills at a level which enables clear definition of the tasks of the unit and/or staff group concerned.

4.2.   Use of skills profiles

Skills profiles may be used for several institutional development processes. The most typical situations include:

(a)   defining organisation and/or unit specific skills profiles concretises an organisation's/unit's strategic key skill areas, thereby clarifying the staff's understanding of an organisation's objectives and priorities. This contributes to a commonly shared operational vision of the organisation;

(b)   skills profiles are efficient tools for concretising the tasks of a new employee;

(c)   comparing the skills profile and actual skills and performance identifies training and other institutional development needs.

Skills profiles may be used as practical tools for development discussions between managers and staff members.

5.   Problems and gaps in forest-related education and training in the Russian Federation

Problems that influence education or training institutions in their present activities and hinder their partnerships in educational development processes described above, can be broken down as follows:

(a)   general problems:

    (i)   functional literacy/information processing skills;

    (ii)   inequities in learning opportunities/financing reform in education:

- equal/unequal opportunities for basic education,
- education budget allocation between primary, secondary and academic levels,
- cost-effectiveness of educational input,
- distribution equitably across jurisdictions,
- increased private financing disadvantaged poor/scholarship system;

    (iii)   public financed education of GDP:

- minimum recommended level 5 %,
- State budget and taxation versus regional or local taxation,
- administrative structure related problems.

These general problems are typical for the whole educational sector, and can be solved and improved mainly at political and decision-making levels at federal and regional levels. Solutions and improvements directly influence forestry sector related education as well, but cannot be solved by or within the sector;

(b)   management related problems:

    (i)   management skills;

    (ii)   cost structure: for instance, dominant energy costs;

    (iii)   maintenance of infrastructure and repair of facilities;

    (iv)   modern, appropriate technologies for practical training;

    (v)   client orientation;

(c)   function related problems:

    (i)   didactic materials;

    (ii)   upgrading knowledge and skills of teachers;

    (iii)   teachers and costs;

    (iv)   meals;

    (v)   dormitory;

    (vi)   cleaning;

    (vii)   maintenance and repair of facilities.

5.1.   Transfer of best practices

These matters are also analysed in TNAs as naturally the supply side of educational markets are to be studied simultaneously with the demand side. The focus in TNAs is usually on knowledge and

skills of teachers and trainers to be trained, but additionally educational conditions and facilities and other resources are studied to find gaps that should be filled during the development process.

Education and training institutions can mainly influence management and function related problems by improving their management systems and upgrading skills and knowledge of teachers and other personnel. Of course the principal and other managers of an institute are key in this. Many topics such as how to organise meals, dormitory, cleaning and maintenance and repairs can either be outsourced as they are in western industrialised countries, or they just have to be developed in other ways according to the needs of modern life.

One thing missing in all societies, or at a weak stage, is the transfer of experiences and best practices on these topics, or even a management system that has been tested in varying conditions and has proved to be feasible for replication in modified format to other regions or even countries. Thus it is of utmost importance networks be built between universities and colleges in education of the forestry sector within Russia as well as between Russia, the Baltic States and other OECD countries. A regional network of north-west Russia, the Baltic States and Nordic countries would be a good start to this type of exercise. Unofficial networks of Russian universities and an official one of forest colleges under the Ministry of Education could act as a basis for it.

6.   Appropriate training approach

It is also important to recognise the educational structures that would be used in the development process and how the problems should be solved. In principle, the approaches used in training where external expertise and/or (co)funding is involved, can be divided into three:

(a)   substance-based approach

(b)   training system-based approach
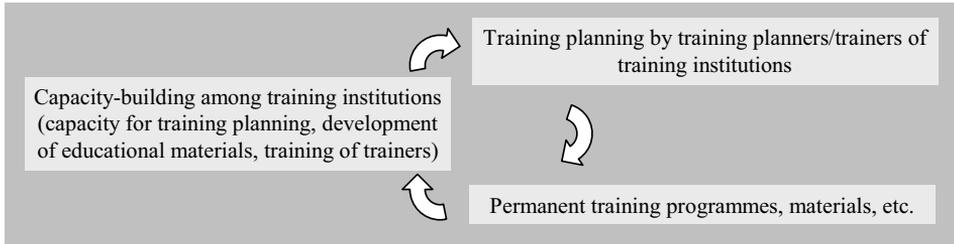
(c)   resource- and delivery-based approach
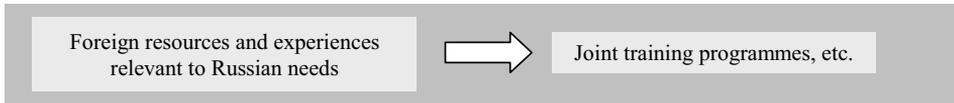
The World Bank SFPP has mainly been using the substance-based approach in regional loans preparations and in the federal component, as the private sector and the State Forest Service recommend tailor-made solutions. That is understandable if the problems and gaps in skills and knowledge have been identified systematically and deeply enough. Unfortunately regional loans did not materialise in the World Bank SFPP and thus the training process also became obsolete. The pilot regions agreed with the systematic approach described above, and it is also, from the unique appliance of such a systematic approach, a shame that the regional loans did not materialise.

In the World Bank SFPP federal component skill needs have been identified at expert level and training sub-components have been designed based on these findings.

A resource- and delivery-based approach is typically applied in bilateral jointly funded programmes and projects such as the Finnish and Swedish funded ones. They are mainly based on experiences gained and resources from donor countries and their human resources. The main problem that hinders development is the same as in the first mentioned approach, namely it may solve problems, but the sustainability is questionable as long as there are no relevant supportive educational structures in the target country or region. The only approach that tackles this structural problem is the training-system-based approach. It was selected in the new Finnish-Russian bilateral programme on forestry in north-west Russia for 2005-10. But if the aim is to support concrete problem solving, it has to be combined with the other problem-oriented approaches so concrete steps and achievements can be reached and structural changes materialised. It is also the approach that supports tackling the problems described in Chapter 3, the general and management and functional types of problems in the educational sector related to forests.

7. Forestry sector development and its relation to policies

Forestry sector development is to a large extent dependent on development of relevant forest policy and legislation. They are key when structural reforms and improvements are made. However, in all societies forestry sector development has links to and dependencies on other sectoral and macroeconomic policies and development strategies. The closest links are usually with nature conservation and environmental protection activities and policies. These strategies have to be considered when forestry and forest industrial development plans are made and carried out. Energy-related policies and development strategies are increasingly important for wood biomass (fuelwood, waste wood, wood waste and waste liquids) and integrated industrial entities, as well as for the overall development of energy strategies as forest industries are among the most energy consuming industries.

In most countries including new EU Member States, rural development policies and strategies play a key role in forestry, and thus rural issues, particularly from the socioeconomic viewpoint, are among the core ones. Unfortunately this is lacking in the Russian Federation as there is no comprehensive rural development strategy; on the contrary, rural areas have been and are gradually deteriorating, particularly northern areas.

Forestry and forest industries have a strong impact on the employment market, and thus methods that enable foreseeing future development trends are valuable. Unfortunately, from the social viewpoint, modern forest industries use fewer employees and more efficient and productive machines, so mechanisation typically occurs at the cost of local people. But it can also have a

positive impact as efficient and profitable forest industries can provide more permanent and sustainable employment possibilities than uncompetitive ones. Modern forestry and forest industries provide increasingly more opportunities for SMEs in all countries with economies in transition including Russia.

For educational development in the forestry sector links with the structural changes made in the overall education sector are of utmost importance. Educational development activities in the forestry sector should always be linked to and developed based on the general educational reforms. Unfortunately this has only been theoretic, for example in the Baltic States where, externally funded development efforts based on Phare programmes, general and sectoral projects have too seldom met with each other, or have been streamlined into the same development objectives. This is a problem in the Russian Federation as well.

Industrial development and investment in rehabilitation of old factories and in new ones are the main bottlenecks at the moment in the Russian forestry sector. There are still numerous factors that prevent foreign investors from investing. They can be identified at federal, regional, local and enterprise levels. Most federal and regional factors are macroeconomic in character, and are commonly found in most industrial sectors in the Russian Federation. Some factors can be considered as restrictions of exports and imports but they should be solved during Russia's preparatory phase for WTO membership. Only a few restrictive factors for investments can be solved by forestry sector actors themselves. Thus it is necessary to link investment and industrial development to economic macro-policy, which deals with policies and regulatory frameworks in taxation, foreign trade, protection of investments against various aggressive measures, etc.

There is a current trend to support federal powers and forces rather than regional ones. It is evident, however, that most investments in the forestry sector will come from SMEs and the regional and local problems preventing them from investing should be solved. A single investment for forest harvesting and wood processing is always dependent and fixed with certain sites and other physical conditions. Usually the human resources needed are searched for and recruited from the same location. Thus it is important that regional and local structures such as educational institutions are supported.

Investors will buy supportive training from relevant educational institutions. Currently, training for certain jobs and professions such as modern forest machine operators can be found in neighbouring Nordic and Baltic countries. This situation is not at all sustainable in the long term. Nevertheless, it is for regional and local authorities and policy-makers to establish or improve existing institutions with such reforms that guarantee sufficient and feasible educational services to satisfy training needs. Often these institutions believe that forest industries should take the main responsibility for developing these educational institutions, but that is in almost all cases false. It is the role and responsibility of the public sector.

It is also sensible and often necessary to link the targeted reforms to international financing and development mechanisms. Usually the main structural reforms require close collaboration with the International Monetary Fund and the World Bank family, whether their objectives or methods are appreciated fully, or not. Some structural reforms have also been funded and supported by regional development banks, or the European Commission. However, typically

projects of the latter provide support in solving certain clearly identified problems, but seldom policy and regulatory framework-related structural problems.

For instance, in the Russian Federation the government linked sectoral programmes to follow the International Monetary Fund macroeconomic programme. Sectors were prioritised by the government and supported by the *Duma*. The forestry sector was selected as the second most important sector at the beginning of the 2000s, so it was offered simultaneously three development loans, one for improving the investment climate, one developing practical forestry and forest industries and one for environmental conditions of selected forest industries (mainly the Baikal pulp mill). These loan-based programmes have been supported by a grant programme from the Global Environment Facility (GEF), developing nature conservation in Russia, focusing on national parks and relevant policies.

Unfortunately, links and cooperation between various sectoral development strategies and policies is typically lacking in practice. Good examples are development projects in education and human resource development in the forestry sector in St Petersburg and the Leningrad *oblast* financed internationally by the World Bank, International Finance Corporation, the EC/Tacis, the European Training Foundation as well as bilateral donor agencies. In recent years all these organisations have funded development projects without practical coordination or collaboration with one another's activities to enable them to benefit from one another's experience and lessons learned at practical or policy levels. This type of cooperation is just starting, yet these organisations have (jointly) funded projects in Russia for the past decade. Still links with relevant policies that could and should support these activities are loose, or do not exist.

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Regional labour market information system on school graduates (RISA)

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The contribution presents the regional labour market information system on school graduates (RISA) project, its objectives, target groups, main information and analytical components and links to other information systems in the Czech Republic. RISA was recently established as a complex and flexible information system available on the Internet. It provides for collecting, processing and analysing information on development of offer and demand on the regional labour market, changing qualification requirements in individual branches, employers' needs and development of the education system.

1.   The main goal

The main goal of the regional labour market information system on school graduates (RISA) project, funded under the Phare programme 2000, was creating an integrated information system providing for collecting, processing and analysing information on development of offer and demand on the labour market, changing qualification requirements in individual branches, employers' needs and development of the education system.

RISA makes it possible to look back at development of the situation and at the same time it creates the starting point for short-term forecasts necessary for further developing the education system.

2.   Target groups and their information needs

Tailor-made output from the information system is directed at various target groups. They are addressed to public administration (regional authorities, labour offices), schools, employers and personnel managers, counselling and guidance systems, and the general public (especially those who apply to study or look for a job after graduation).

In creating the information content there is a maximum effort to respect and fulfil the information needs of target groups:

(a) regional offices are in charge of regional school policy, especially when creating a concept of regional school networks. They need information on development of VET concepts and VET content, and general information on development trends on the labour market, on prospects of individual sectors in the region, the needs of employers, vacancies, labour-market success of school graduates;

(b) labour offices including information and counselling centres (IPS) create jointly regional policy of employability; they need information on the number of school graduates in individual branches, development of VET concepts and VET content as well as development trends on the labour market;

(c) schools need information, either for counselling and guidance services for career path choice, or for developing educational opportunities in schools and designing and implementing curricula. For these purposes they need information on VET concepts and VET content and information on the present and future needs of the labour market;

(d) employers need information on the supposed number of school graduates in various branches, VET concepts and content development, the characteristic of educational content of individual branches and views of school graduates on their success on the labour market for formulating and implementing personnel policy;

(e) study applicants can use RISA outcomes for making decisions on educational paths. They should have the information to enable them to be well versed on the situation on the labour market and on supposed development trends;

(f) school graduates decide on further study. RISA outcomes can serve them with better information on the labour market situation;

(g) counselling systems play the role of contact links for the above information.

3. The main components of RISA

3.1. RISA database

The RISA database will provide regular collection, control and processing of data, their import from other information systems (especially ISA – the national information system on placement of school graduates on the labour market, where data will be available in a uniform structure at national level), their archiving and preparation for further use.

3.2. Surveys focused on the needs of the regional labour market

Surveys on the needs of the regional labour market are aimed at identifying qualification and competences required by employers. They include:

(a) inquiries of employers on the structure of the required skills and competences and the extent to which school graduates meet the competences required by the labour market;

(b) analyses of vacancies offer at labour offices;

(c) analysis of advertisements from the respective and neighbouring regions – regular monitoring of job offers in the main regional daily newspapers and on the main Internet servers with emphasis on the structure of the offered professions and on the required competences;

(d) demand for specific professions by recruitment agencies – opinions of recruitment agency personnel on the structure of the professions in demand, the required qualifications and competences.

3.3. Surveys focused on placing school graduates on the labour market

Labour office surveys define the main problems of employment for school graduates and analyse the causes of these problems and chances for school graduates on the labour market. Surveys among students seek opinions of students of certain selected branches in the last

grade of secondary schools (secondary vocational schools and secondary technical school) on whether they were properly trained by their school, whether they acquired suitable knowledge, skills and competences, and their views on future expectations. The surveys concentrate on four groups of branches but gradually they will cover the whole spectrum of the education offer.

3.4. Analytical activities and information on education offers

These consist of analysing development of structures of professions and types of education in regions and the correspondence between those structures and structures of school graduates. Concordance between qualifications and employment and financial reward for the respective qualification on the labour market is also monitored. Data are compared against the relevant data for the whole Czech Republic and other European countries.

Analytical activities also include attempts to predict further development in placing school graduates on the labour market, taking into account changing education and qualification structure in comparison with long-term changes in other developed countries and analysing past trends.

Information on the education offered in schools in the region is continuously updated. It includes:

(a) standard information about school offers;

(b) description of branches (their content, job opportunities, matching or mismatching acquired education and jobs and its practical use in jobs);

(c) institutions' offers outside the education system;

(d) data on demand for education.

4. The main characteristics of RISA

RISA is open and flexible: it is open to users' comments. Output must respond to their needs as much as possible. RISA should be open to new methodological procedures and analytical methods (e.g. forecasting future development). RISA output should have the highest possible information value.

RISA uses standard methodological tools (classification, code books, and terminology). Therefore, it can adopt (or share) sources of data from other information systems. RISA output and other information systems are therefore compatible and can be linked.

The content and format of RISA information output responds to specific individual needs and target groups.

Information is available for all on the Internet (http://www.risa.cz/).

Although all above features show many objective strengths of the system, RISA has several weaknesses. Financial support for RISA further development in post-project phases is not certain. Another possible weakness is whether regional partners for RISA are prepared to update data after the project ends. Therefore, carefully chosen partnerships and motivated and committed decision-makers at regional level are especially important for the future sustainability of the

system. To assist with sustainability of RISA, methodological support could be continually provided by the National Institute of Technical and Vocational Education (NUOV).

5.   ISA and RISA

The national integrated information system for collecting, analysing and mediating information on the transition of school graduates into work (ISA) is being established at national level in the Czech Republic and can be linked to RISA.

The two systems share the same concept and features.

RISA focuses on regional data, and gives a more detailed look at the issues for placing school graduates on the regional labour market. The regional information system is available on the Internet. RISA is used by several entities in career counselling (education – career counsellors at schools, pedagogical-psychological counsellors, and information centres of labour offices). Information is targeted and brief giving easy access to individual users.

ISA relies on nationwide data which is not yet accessible on the Internet at the moment. Output is available in printed format and is destined for administrators and analysts. Present activities within ISA are funded by the Ministry of Education, Youth and Sports which uses the results for making decisions on further VET development in the Czech Republic. The ISA concept will be further developed through the system project 'Education – Information – Counselling – VIP career', which will be launched under the European Social Fund. We suppose that other RISA projects will be implemented in other regions of the Czech Republic under the ESF.

Skills for business: a sectoral approach to identifying skill needs in the UK

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This contribution gives an overview of Skills for Business – a new organisation, or more accurately, a new network of organisations – in the skills policy landscape in the UK. A key objective of Skills for Business is to bring employers to 'centre stage' in skills policy, encouraging them to articulate clearly their skill needs, and to influence training and education provision. Skills for Business takes a sectoral approach to identifying employers' skill needs. It consists of a network of sector skills councils (SSCs), which are in turn supported and directed by a central organisation, the Sector Skills Development Agency (SSDA).

1. The context: the UK productivity problem

At the outset of this paper, I would like to discuss briefly the broader socioeconomic and political context within which the Skills for Business network has emerged.

Of central importance is an issue often referred to as the 'UK productivity gap'. This refers to the way in which the UK is underperforming when compared to many other industrialised countries in terms of productivity. There is much evidence of the existence and scale of this productivity gap. One recent study (O'Mahoney and van Ark, 2003), for example, has shown that productivity levels in the UK are lower than in most EU-15 countries (apart from Greece, Spain and Portugal). This study shows that GDP per hour worked is some nine percentage points below the EU average. When compared with the US, the UK is 16 percentage points behind.

Importantly, when these statistics are broken down, there is considerable diversity in productivity between industry sectors in the UK. In other words, the size of the productivity gap is markedly more pronounced in some sectors than it is in others. The Groningen 60 industries database is a valuable resource ([55]) which allows analysis of sectoral productivity differences across the EU and the US, measuring against the EU average. This database shows that the UK performs above average in 16 sectors, but below average in 37 sectors. Sectors which are particularly strong in productivity in the UK include mining and quarrying, leather and footwear, electronic valves and tubes, and radio and television receivers. Sectors where the UK is comparatively weak in productivity include textiles, wood and wood products, rubber and plastics, retail, hotels and catering, and research and development (Campbell and Garrett, 2004).

The UK productivity gap is understandably a subject of concern for the UK government. Indeed, it has broad significance: improving productivity is seen as key to securing higher living standards, and as such, the productivity problem is currently central to the UK government's political agenda. The sharp differences between sectors discussed above highlight the need for sectorally sensitive productivity policies.

([55]) Groningen Growth and Development Centre: http://www.ggdc.net.

1.1.   The importance of skills

Research into differences in productivity between countries has shown there is a link – albeit a complex one – between levels of productivity and the skills held by the workforce (Felstead et al., 2004). In the UK, evidence of this link is compelling.

First, it is frequently reported in various research studies, as well as in the industry and popular press, that UK employers are experiencing considerable skills deficiencies. In the UK surveys use definitions which identify two types of skills deficiencies. First, 'skill shortage vacancies' refer to problems within the wider labour market, or where applicants lack the skills that employers require. Here, job vacancies are 'hard to fill' because of a lack of applicants that possess the skills, experience or qualifications required. Second, 'internal skills gaps' relate to the existing workforce in a firm: they arise when employees are less than fully proficient in their job roles, or lack the skills needed to meet current and future business objectives (Campbell and Garrett, 2004).

On skills shortages, the 2003 national employers skills survey (NESS) (IER/IFF, 2004), a major survey conducted in England involving interviews with 72 100 establishments, found that approximately 8 % of employers reported hard to fill vacancies. Overall, 4 % of establishments in England reported that they were finding it hard to find suitably skilled applicants to fill some vacancies, or in other words, were experiencing skills shortage vacancies. There is considerable variation in skills shortage vacancies between sectors, with the wood and paper, construction, transport and agriculture sectors experiencing the highest proportion of these types of vacancies. Figures were similar in other countries in the UK (Scotland, Wales, Northern Ireland), using comparable survey data.

The evidence shows, however, that it is internal skills gaps rather than skills shortages that are the biggest problem. In England, the national employers skills survey 2003 found that between a fifth and a quarter of establishments (22 %) reported they had skills gaps (or felt at least some of their staff lacked proficiency). Again, there is also some variation in skills gaps by sector. Interestingly, statistics vary quite markedly between different UK countries, using comparable survey data. Establishments in Scotland were most likely to report skills gaps, with 24 % of employers stating that at least some of their staff were not fully proficient, compared to just 13 % of establishments in Northern Ireland.

Importantly, there is evidence from these and other surveys that skills deficiencies are impacting negatively on business performance. The national employers skills survey 2003 in England reports that in skills shortage vacancies, 83 % of employers felt these were causing increased workloads for other staff, and a further 52 % felt they caused customer service difficulties. Turning to skill gaps, around a third of employers cited the following impacts: difficulties in meeting customer service aims, difficulties in meeting quality standards, and increased operating costs.

These general problems in skill deficiencies are cross-cut with the uneven distribution of skills within the UK population, an issue acknowledged in the UK government's recent *Skills strategy white paper* (DfES, 2003). The UK has a marked basic skills problem, and it has been estimated that as many as one in five adults in the workforce are functionally illiterate, and as many as one in four are functionally innumerate (Westwood, 2004).

It is often stated that skills deficiencies are especially pronounced among long-term unemployed people. The perceived problem of the 'gap' between the skill levels in the labour pool and those required by employers for the jobs available is sometimes referred to as 'skills mismatch'. Both the UK government and the EU have emphasised the need for action in plugging this skills gap to tackle long-term unemployment and social exclusion. Several policy initiatives have emerged over recent years targeted at improving the 'employability' of the long-term unemployed, and aimed at reducing the gap between the 'skills rich' and the 'skills poor' (DfES, 2003). There is also a geographical dimension to these problems, and unevenness in the skills bases found in different regions and localities of the UK. It is now recognised that these and other labour-market inequalities (such as those related to gender, ethnicity and age) need to be tackled if the UK is to make better use of the skills and experience of the workforce (Stanfield, 2004).

There is clear evidence that the UK is underperforming in productivity, and this is likely to be connected to widely acknowledged and complex problems with skill deficiencies in the labour market. Several studies have attempted to make the link between skills and productivity more explicit.

This research has tended to focus on the impact of training and higher level skills on organisational performance. For example, in training, one study has shown that a 5 % increase in the training rate (the proportion of employees participating in training) is associated with a 4 % increase in productivity (measured by value added per worker) (Dearden et al., 2000). On the impact of higher level qualifications on the workforce, several studies have reported a positive effect on productivity. For example, Haskel et al. (2003) report that the top 10 % of productive firms in the UK had workers with an average of two years additional education than firms in the bottom 10%. The higher level of skills found in the workforce in top firms lead to innovation and more sophisticated production processes. The skill difference was found to account for around 8 % of the productivity gap between the top and bottom firms.

Recent research has shifted to take a wider view of the relationship between skills and productivity, looking broadly at how performance is affected by an array of human resource management policies and practices that attempt to make more effective use of the skills held among employees. In particular, research attention is turning to examine what have been termed 'high performance workplaces'. Although this is an area in which there is considerable debate, the high performance workplace is generally perceived to be one in which the skills of workers are invested in and developed to improve organisational performance. Several studies have made links between high performance working and business performance.

It is important to note there is evidence that investing in skills not only has benefits for business and the economy, but also brings benefits to individual workers. A recent review of research published by the Sector Skills Development Agency (SSDA) (Tamkin et al., 2004) notes here is now a considerable body of evidence that shows that greater education and higher level qualifications lead to higher salaries (particularly academic qualifications, to a lesser extent vocational qualifications). Those engaged in lifelong learning are also less likely to suffer from unemployment. There is also evidence that high performance working brings about increased job satisfaction, motivation and commitment of the workforce.

There is persuasive evidence, therefore, that investing in the skills of the workforce has real benefits, both for improving productivity, and for improving the quality of life enjoyed by

individual workers. There is also further impetus for the UK to address the skills issue: economic change. There are two key developments of particular importance here.

First, there is general consensus that the economies in industrialised countries have changed fundamentally over the past 20 to 30 years, gradually shifting from emphasis on manufacturing to services. This is having important implications on the skills required by employers, as jobs involving manual or technical labour decline, and service-orientated work increases. Although there is debate about the precise nature and extent of these changes, there is a general consensus that jobs involving 'thinking' and interpersonal/communication skills are increasing. Several studies have reported, however, that although they are in demand, these sorts of generic skills are currently one of the main areas of skill shortage in Britain (DfEE, 2000; Futureskills Scotland, 2002).

Second, intensifying globalisation is also bringing about increased competition for businesses. There is general recognition that the UK can no longer compete effectively in world markets on price or low wages. To build a competitive and productive economy, the UK government believes there is a need to upskill the workforce, or to take what has been termed a 'high skill' strategy. The aim is to encourage businesses to move away from low-skill, low value-added product strategies, and instead to move 'up-market'. As the Skills strategy white paper puts it, focus must be on 'innovation, enterprise, quality, and adding greater value through our products and services. All of that is dependent on raising our skills game (DfES, 2003, p. 11).

1.2. The skills for business approach

Establishing the skills for business network forms a key part of the UK government's current skills strategy, and represents a drive to address the important and complex issues discussed above, in particular, to raise productivity levels and ensure employers have access to, and, importantly, play a part in developing, the skills they need among the workforce.

The skills for business approach is characterised by a demand-led focus, and as such employer engagement is central. In the past, skills and labour-market policy in the UK has tended to focus on the supply side (e.g. by efforts to increase the number of university graduates). However, there is now recognition that both individuals and employers need to 'raise their game' in the area of skills. Although employers are often vocal about the problems they are facing in skills, in the past it has been difficult to engage them in the policy process. As one author points out: 'There are many employers who want to complain about skill shortages, about the deficiencies in the education system that fail to adequately prepare skill levels. And there has been a shortage of those employers who are prepared to sit on task forces and skills councils and tell the government what is wrong. Many are quick to criticise the lack of specific skills or the quality of training available to them, but are loath to do much about it' (Westwood, 2004, p. 48).

The skills for business approach represents an attempt to resolve this situation, to get employers centrally involved in policy on skills and productivity issues, on a UK-wide scale. Importantly, as noted above, reflecting this strong emphasis on employer engagement, skills for business is characterised by a sectoral focus.

In organisational structure, skills for business consists of a network of sector skills councils (SSCs) which are independent organisations run by employers for employers. SSCs are

developed by groups of influential employers in industry or business sectors of economic or strategic significance. These employer-led organisations actively involve trade unions, professional bodies, and other key stakeholders in a sector. Each SSC has a chair and a board, which is representative of the range of employers within the particular sector, including small businesses, and other key partners. SSCs are licensed by the Secretary of State for Education and Skills in England, in consultation with ministers in Scotland, Wales and Northern Ireland. Aspirant SSCs must meet the required standards to receive a licence, and demonstrate ambition as well as a sound business plan. The quality of the board must also be approved by government if an SSC is to achieve a licence. Licences are awarded for five years, subject to satisfactory reviews. At the time of writing, there are 20 licensed SSCs up and running, covering a range of industry sectors, and five others are working towards their licences.

The role of SSCs is to ensure the skill needs of their employers are met, to identify productivity issues, and contribute to organising provision of training and education within their sectors. In return they receive substantial public investment, and greater dialogue with government departments across the UK. The aim is to enable employers to have a far greater impact on policies affecting skills and productivity, and increased influence with education and training partners. Individual SSCs agree sector priorities and targets addressing the following four key goals:

(a) reducing skills gaps and shortages;

(b) improving productivity, business and public service performance;

(c) increasing opportunities to boost the skills and productivity of everyone in the sector's workforce, including action on equal opportunities;

(d) improving learning supply, including apprenticeships, higher education and national occupational standards.

Another organisation – the SSDA plays a central role in the skills for business network. The SSDA was established in 2002 to manage the establishment of SSCs, as well as fund, guide and underpin the SSC network (DfES, 2001), and it also performs a vital performance monitoring function to assess the overall impact of the skills for business network. The SSDA is a company limited by guarantee and a non-departmental public body, headed-up by a business leader chair, and a chief executive, both of whom are appointed by the Secretary of State for Education and Skills in England. The organisation also has an employer-led board whose remit is to ensure the relevance of the SSC network's impact (for more information see: http://www.ssda.org.uk).

2. Identifying skill needs: the research remit

The need for a strong evidence base which underpins policy action is central to the ethos of the skills for business network. As the *Skills strategy white paper* notes: 'We will […] expect each sector skills council to deliver top quality analysis of international, national and regional trends in labour, skills and productivity in their sector' (DfES, 2003, p. 47).

The SSCs and the SSDA together undertake a wide range of research activities focusing on collating labour-market information, and on identifying and articulating skill needs on a sectoral level, to build up this evidence base.

SSCs are developing research programmes focusing on collecting and compiling important labour-market information, and capturing the skill needs and productivity issues within their specific sectors. This work often involves the close cooperation and involvement of employers. A key document which all SSCs produced at an early stage is known as the *Market assessment*. All SSCs were required to produce these documents as a condition of being awarded a licence. SSC *Market assessments* are pivotal documents which aim to provide a strategic review of the key skills and productivity issues within a sector. The documents were intended to be concise and readable, and the first step in SSCs establishing themselves as experts on skills and labour market issues within their sectors. The key sections contained in *Market assessments* were: market pressures and performance; changing skill needs; a vision for the sector ([56]). Martin Arnott of ConstructionSkills (the SSC for the construction sector) gives a more detailed insight into the sort of research work being carried out by his SSC in his contribution to this volume.

The SSDA also performs a crucial research function, complementing and strengthening the work conducted by SSCs. In a sense it provides more of an 'umbrella' or overarching research function compared to the more sector-focused work of SSCs. The research work carried out by the SSDA can be classified into three main categories, and key activities within each category are outlined below.

The first category of research activity performed by the SSDA research team is collating and presenting high quality labour-market information (LMI), and breaking this down by sector, using reliable national data sources. This involves working closely with partner organisations with a LMI remit to ensure coordination in data collection. Its key purpose is to ensure that complex data is collected and 'packaged' conveniently for SSCs so they can use and interpret it effectively.

A key activity includes development of the SSDA sector skills matrix. This online database provides a range of economic, employment and skills data, broken down by individual sector. Using national sources, the matrix presents comparable data for 27 industry categories and 14 more aggregate sector groupings. It also provides the same range of data for a selection of SSCs where this is possible. The matrix database is the single most comprehensive source of national sector-level data currently available in the UK ([57]).

Another key area of LMI research activity undertaken by the SSDA is creating specially tailored SSC reports. These reports summarise information gathered in the national skills surveys in the UK, breaking these down so they are relevant to each SSC ([58]).

The SSDA is also working to ensure that a consistent approach to projected LMI is developed and used across the skills for business network. To this end, the SSDA is leading a research project focusing on generating national projections of employment by sector and occupation

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([56]) More information is available from Internet: http://www.ssda.org.uk/ssda/PDF/SSDA_assessment.pdf [cited 25.4.2006].

([57]) The matrix is available from Internet: http://www.ssdamatrix.org.uk [cited 25.4.2006] and free to access.

([58]) The SSC reports for the UK are available from Internet: http://www.ssda.org.uk/ssda/default.aspx?page=867 [cited 25.4.2006].

over the next 10 years. This project is entitled working futures. The first national level working futures report was published in 2004 (Wilson et al., 2004). To keep these LMI projections up to date, the SSDA has commissioned a second working futures report. Work is currently underway on this, and the final report is expected soon.

In addition to these data collection and presentation activities, the SSDA also produces a monthly skills policy and research briefing entitled *Intelligence* (^{59}), which is produced in cooperation with the Policy Research Institute at Leeds Metropolitan University. This provides up-to-date intelligence relevant to the SSDA and its key partners, including outlining the latest policy and research developments. Finally, the SSDA website also provides a single gateway to skills intelligence via 'one stop' – which brings together various information accessible to a range of consumers of skills intelligence (individuals, employers and LMI professionals). The aim of this is to help users navigate through existing LMI and encourage shared dialogue (^{60}).

The second category of research activity carried out by the SSDA is evaluation. As noted above, the SSDA plays a key role in monitoring the performance of the skills for business network, showing the contribution it makes to the skills and productivity agenda in the UK. To do this, the SSDA established a performance monitoring and evaluation framework. This sets out a series of performance measures and indicators related to policy objectives. Data is systematically collected to monitor progress of the skills for business network against the framework. In addition, a rigorous evaluation programme has been designed to assess effectiveness. This is a multifaceted programme consisting of a range of different components, including a nationally representative survey of employers, a survey of key stakeholders (including officials of government departments, educationalists and representatives of government agencies), and qualitative case study research with selected SSCs and the SSDA. The first phase of evaluation of the skills for business network is now published (SQW Limited, 2004) and available online.

The third category of research activity being undertaken by the SSDA can be broadly labelled as 'big picture research'. A range of research projects are being undertaken which aim to further develop understanding of skills and productivity issues, and strengthen the evidence base underpinning the skills for business network. While SSCs have a sector-specific focus, the SSDA is concerned with national and economy-wide issues which affect the whole network and have a cross-sector focus. The SSDA is also working on and developing several projects which aim to consider the situation in skills and productivity in the UK in an international context, allowing comparisons to be made at sectoral level between the UK and other countries. This big picture research often involves working in partnership with other government departments and organisations to share knowledge and avoid duplication.

There is, therefore, much research activity currently taking place across the skills for business network. This reflects the strong commitment to an evidence-based approach to policy development, and an ambition to build a reputation for high quality, world-class research on skills and productivity.

(^{59}) Available from Internet: http://www.ssda.org.uk/cgi-bin/go.pl/newsletter/index.html [cited 25.4.2006].

(^{60}) Available from Internet: http://www.ssda.org.uk/ssda/default.aspx?page=28 [cited 25.4.2006].

3. Looking to the future: sector skills agreements

Before concluding, I would briefly like to consider a new and crucially important phase in developing the skills for business network: sector skills agreements (SSAs).

SSAs are 'compacts' between SSCs, employers and training/education providers. They provide a mechanism by which employers in each sector can identify their main skills and productivity needs, the action they will take to meet those needs, and how they will cooperate with providers of education and training so skills demand can directly shape the nature of supply. On an operational level, SSAs will provide a framework which allows employers and SSCs to sign up to a key set of sector skill priorities with the main funding and delivery agencies. This framework will also allow all parties to agree what actions will be taken collectively to meet the identified priorities.

Practically, each SSC is expected to work closely with employers and training providers to broker a collaborative skills agreement which sets out a long-term agenda for action on skills. The key overarching objective is a deceptively simple one: to ensure that 'the skills that the sector needs are the skills a sector gets'.

Development of the SSA consists of five-key stages. This begins with an initial skill needs assessment. This is the foundation of the SSA and consists of a high quality, detailed, convincing and rigorous analysis of a sector's current and likely future skill needs, drawing on a range of data sources. Subsequent phases consist of: assessment of current public and private education/training provision; analysis of the gaps and weaknesses in current workforce development activity; an assessment of scope for collaborative action to tackle skill deficiencies; and finally, development of a costed action plan detailing the proposed contribution of each partner.

At present, four so-called 'pathfinder' SSCs are currently drawing up SSAs in their sectors. Several other SSCs began the SSC process in early 2005, and 2006 will thus be crucial for developing the skills for business network.

4. Conclusion

In this paper, I have outlined the background to, and overall objectives of the skills for business network. I have attempted to highlight the key aspects of this new employer-centred, sectoral approach to identifying skill needs in the UK. With development of SSAs, the next few years will be a testing time for the network, and it is likely that many challenges will be encountered. A central consideration will be ensuring the skills for business network is effectively integrated into existing institutional structures regulating skills and vocational education and training across the UK. In addition, a further challenge will be to ensure SSCs are effectively engaging with employers to identify clearly not only current, but also future skill needs. It is crucial these issues are addressed if the network is to have a positive impact on changing existing systems of education and training, and is able to begin to tackle the UK's productivity gap.

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Anticipating skill needs in UK construction

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This paper gives an account of how a sector skills organisation in the UK goes about anticipating future skill needs of the workforce. It describes how a programme of research is maintained to provide an integrated appraisal of skills, taking the usual supply and demand approach. Six separate research projects are covered, with a commentary on how the analysis is applied and issues regarding the whole exercise.

1. ConstructionSkills – a sector skills organisation

As background to our work on anticipating future skill needs, I would like to present briefly our organisation. ConstructionSkills ([61]) is one of around 20 official bodies responsible for skills and training in industry sectors in the UK. We are a national organisation, funded by employers, and are expected to be the voice of the industry in dealing with government and the education system. Our research activities are managed by a small in-house team working together with a range of consultants and academics. We receive funding from government and local partners to support this.

The analyses we produce provide the evidence base for strategy and planning for skills at national and regional levels. Estimates of workload in construction are expected to correspond to local construction projects, and figures on the demand for skills are used to plan training provision. So, as well as being detailed and up to date enough to be applied to planning, the analysis is expected to be farsighted enough to cope with longer-term change. To provide this level of sophistication the research programme is continuous, reporting annually in a document shared by around 3 000 organisations in the UK.

2. Components of the research programme

Six main components of the programme form the building blocks of our analysis:

(a) industry change
   industry change is delivered through a web-based database called *FutureSkills*. The database provides up-to-date information on trends in construction, categorised into technical, social, legislative, etc. The changes are then analysed in terms of their likely consequences for skills. For example, new legislation on waste management has stimulated growth in the reclaimed materials market and brought in new skill needs for demolition workers.

   The database is fed by reports from our in-house team, plus feedback from various expert users of the website. It receives around 2 000 visits each month from a UK and international audience. The database is used to generate reports on skill change which are used to inform training strategy and development of qualifications;

([61]) See: http://www.constructionskills.net/ [cited 5.5.2006].

(b) occupational change

we look at change within occupations through a series of company surveys. Employers are asked to identify tasks commonly performed in their companies by the workforce in different occupations. Reports on the findings are used to plan training and developing qualifications;

(c) employment forecasting

we produce forecasts of the numbers of workers needed in future years. Using an econometric model developed over several years, this considers future levels of industry activity. Forecasts are provided of the annual requirement for new workers, by occupation and region, for a five-year period. We can then compare the estimated requirements with the level of training and calculate the likely shortfall or surplus. Results are disseminated to our partners in government and the education system who then use them as a basis for planning provision;

(d) skill supply

each year we run two surveys to monitor the supply of new skills to the industry. First, a survey of training providers gives us detailed information on the number of people beginning construction courses at further and higher education levels. Details are sought on numbers starting by course, level, age, gender and ethnic origin. This allows us to monitor levels of intake into training and compare them to the estimates of demand coming from our forecasting model. It also highlights supply issues in particular regions or occupations.

Each year we survey the trainees themselves. Around 4 000 trainees at craft level are asked about their background and qualifications on entry, their experiences during their course, whether they completed or qualified, and where they went after training. This information allows us to monitor the throughput of the skills supply system and to make any necessary adjustments. It also promotes information on changing trends in the type of trainee entering the industry, especially in terms of age, gender and previous qualifications. These are important as the UK industry is trying to create a more qualified and diverse workforce than in the past, and to make itself more attractive to new recruits;

(e) skill shortage

we have an annual survey of employers to monitor skills shortages in the industry. A representative sample of 500 companies is asked about vacancies during the past six months and whether they were able to fill them. They are also asked about any gaps within the skills of their existing workforce and what kind of strategies they employ for recruiting new workers. This is especially important in construction because of the project by project pattern of work where staff are employed only temporarily on site, often working as self-employed subcontractors. Information on skill shortages allows ConstructionSkills to monitor emerging 'hotspots' in particular locations and occupations;

(f) productivity

our work on productivity provides a different perspective to our other labour-market analysis work in that it aims to identify how changing patterns of skill affect productivity. This is achieved through analysis of large-scale data sets and by case study work within particular companies, and by drawing together workshops of companies and academic experts to discuss these relationships. It seems that just as skills (or a lack of them) can have

an impact on productivity and the emergence of new technologies, so the impact can work in reverse, with new technologies being used to drive down the need for workforce skills to achieve higher productivity. Those studies, which have been published as a series of reports, are used to identify which skills are likely to be critical to increasing productivity in the future and, therefore, where most resources should be directed.

3.   Concluding remarks

I would like to highlight some issues arising from our work: anticipating future skill needs is not an exact science. It provides a framework for thinking rather than generating precise solutions. Once a skill need is identified, it does not necessarily mean a new course needs to be filled. Rather, there are several options to be considered ranging from learning on the job to recruitment of skilled workers, perhaps from abroad, or designing the skill by reviewing the particular business process.

Although the accepted principle behind anticipating skill needs is that training should be demand-led, we need to exercise a little caution. For instance, from an employer perspective the requirement for new recruits might be that they are 'work-ready'. However, this short-term perspective omits to consider some more subtle elements of demand, for instance that trainees might need a broader base of knowledge than required by the immediate job to be able to adapt to changing needs in future. Also that learning on-the-job is often a cheaper and more effective method of learning than that acquired away from the work. The point is that really good anticipation of skill needs must take a holistic approach and a longer-term perspective.

To achieve this we need to set up and resource a continuing capacity to collect good quality data and analyse and interpret it. The key criteria are that the information is robust enough to be reasonably sure about its meaning, and that it should be drawn from a wide and informed range of sources relevant to different industry sectors, occupations and regions. ConstructionSkills in the UK is setting up a skills and productivity observatory to perform these functions. This is expected to draw together data from a range of sources, to test its validity with a permanent industry-based advisory group and to share its analyses with our partners in training. We would welcome links with organisations working in the construction sector in other countries to share our analyses.

Approaches to early identification of skill needs at various levels as an integral part of national systems. Summary and conclusions

Joan McNaboe

Skills and Labour Market Research Unit, FÁS, Ireland

Five speakers participated in this workshop and discussed several issues relating to national and regional analysis of skill needs as an integral part of national systems.

Gerd Gidion spoke on creating efficient team leaders in Germany among skilled workers. The apprenticeship system in place in Germany is well established and as such is in need of modernisation. There is a need both to update skills and adapt to the new working environment, where the need for team leaders has increased with the evolving workplace. Pekka Alhojärvi examined identification of skill needs in the forestry sector in the Russian Federation. There are several policies which affect the forestry sector such as nature conservation, environmental protection, energy and agricultural development. Working life in the forestry sector has developed over the years with the need for comprehensive forest management planning and the use of advanced machinery, etc. These developments have identified gaps in education and training in the forestry sector in the Russian Federation with a need for training needs assessment to be carried out. Helena Úlovcová spoke about the regional information system RISA in the Czech Republic which gathers, analyses and mediates information on changing qualification requirements and employers' needs on the regional labour market. RISA consists of a database, surveys on the regional labour market and placements of school-leavers, analytical activities and information on educational offer.

Vicki Belt addressed the UK's sectoral approach to identifying skill needs both through their Sector Skills Development Agency and several sector specific councils which coordinate activities with employers and training providers. By using existing data sources and their own primary research, they examine what drives skills demand, current skill needs, future outlook and geography. To combat the effects of economic change and global competition, a high skilled strategy is required. Martin Arnott focused on one of the sector specific groups in the UK, namely ConstructionSkills, and the methods involved in anticipating future skill needs in the sector. They receive funding from employers, government and local partners, and anticipating future skill needs is achieved through examining industry change, occupational change, employment forecasting, skills supply and shortages and productivity studies. When identifying skill needs, introduction of a new training course should not be considered the only alternative – on-the-job training, recruitment from other industries or, indeed, other countries should also be considered.

Discussion followed, with attention focusing on our dependence on the business cycle for identifying skill needs. This makes it difficult to sustain a longer term skills strategy. This is particularly the case in industries which consist primarily of small companies and subcontracting. Establishing a permanent monitoring system is thought to be required, rather than waiting for an employer to identify a skill need. The focus also needs to be more on the larger EU labour market – this would lessen dependence on the business cycle.

PART V
Transfer of skill identification results
to policy and practice: systemic solutions

This part is based on presentations and discussion at the workshop, moderated by Bernd Dworschak and Susanne Liane Schmidt, Fraunhofer Institute for Industrial Engineering (Fraunhofer IAO), Germany. The workshop discussed how to ensure research results in early identification of skill needs pass into policy and practice, how it can be embedded in the system, and whether research is linked to counselling and guidance. The workshop drew on experiences of projects and initiatives carried out in France, Germany and Austria. A summary and conclusions of results of the workshop discussion is provided at the end of Part V by the workshop rapporteurs Bernd Dworschak and Susanne Liane Schmidt.

Christine Guégnard
Skills identification in French regions: dream or reality?

Helmut Kuwan
**Transfer of research results to policy and practice – on the road
to implementing research: some observations and conclusions
based on Germany's network of early identification
of skill and qualification needs**

Jörg Markowitsch, Claudia Plaimauer and Reinhold Gaubitsch
**New developments in the early identification of
skill needs in Austria: the AMS skills barometer**

Susanne Schmidt and Bernd Dworschak
**Transferring skill identification results to policy and practice:
systemic solutions. Summary and conclusions**

Skills identification in French regions: dream or reality?

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Centre for Research on Education, Training and Employment (Céreq)
Institute of Research in Education (Iredu), France ([62])

Regions have become the central place for implementing vocational education policy in France. The purpose of this contribution is to reveal the strengths and weaknesses of the regional system, institutional framework and process of skill needs identification in the hotel and catering sector. Analysing the experience of participation in a contract of territorial objectives with regional authorities, professional institutions and the Regional Training and Employment Observatory (OREF) of Burgundy, the author attempts to answer two main questions. Is a common diagnosis on skill needs possible facing the various logics of these institutions? What is the transfer into policy and practice at local level?

1.   From national forecasts to a regional observatory

In France, national planning institutions were supposed to forecast work positions in different professions to bring together the number of graduates with different qualifications and the number of jobs occupied at the moment and expected changes, to determine the skill needs for middle-term forecasts. However, inconsistency between forecast and the real situation was noticed. As a result, efforts to control the relationship between training and employment by means of planning at national level were abandoned at the end of the 1970s. From the middle of the 1980s, the problem started to be treated differently. The new approach is the following: 'Forecast trade and qualification is to analyse the conditions of coherence between developments in employment structure and the evolution of the training system. It confronts two processes which are partly autonomous but equally interdependent' (Freyssinet, 1991). To implement this idea, three levels of analysis are used: national, sectoral and local.

At national level, a macroeconomic frame is used which sets the major trends of evolution of qualifications. Since 1985, the Ministry of Education has been carrying out employment prospective studies regularly, often associated to recruitment forecasts for young graduates. This process mobilises many statistical sources in a prospective approach (Diva, Gesper and Calife-BIPE models) which tries to assess the needs of young graduates by main educational levels. The Ministry of Labour and the Commissariat Général du Plan (Planning Office) has adopted more recently this kind of approach, using the Hermes and Flip-Flap models that provide a medium-term scenario (business, investment, employment forecasts), to a rather disaggregated level of sectors. The model makes it possible to plan employment demand per occupation. The first results show the limits of national contributions and the necessity to

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complete these first actions with local contributions. National quantitative projections of workforce demand for 2000-10 are 21 % for cooks and 2 % for waiters. Between 1990 and 2000, the increase of the workforce in hotels and restaurants at regional level was not as pronounced as at national level (Burgundy +14 %, France +24 %). Consequently, national projections should not be applied mechanically to Burgundy. We can only infer a possible increase in the job volume during 2000-10 but cannot identify precisely the number of individuals involved. So, other regional indicators are required.

At national and sectoral levels and in each professional branch, contracts of prospective studies (CEPs) were implemented by public authorities at the end of 1988. Their goal was to create a common tool for prospective studies as a reference for all actors in management of human resources, employment and training. The contracts also define main national trends for qualifications and skill needs evolution. Today, about 60 professional branches have established CEPs. The one for the hotel and catering sector was established in 1995.

At regional level by sectors, contracts of territorial objectives were created. The law of July 1987 on apprenticeship, established contracts of objectives to coordinate participation of the State, regional councils and professional branches for developing different ways of training, in particular, apprenticeship (dual system). The contracts make it possible to determine in particular the number of graduates to be prepared by type and level of education, the location and duration of training in vocational centres and the types of activities that could encourage training of young people and their families. The contracts aim to plan how to meet the needs of training in the medium term. Actually, 12 professional branches have developed contracts of territorial objectives in Burgundy.

Box 1: A network for Burgundy

OREF in Burgundy started to function after conclusion of the contract of the State-region plan (1989-93). OREF is a network of different institutions: the Adults Vocational Training Association, the Regional Board of Labour, Employment and Training, the Regional Vocational Board of Agriculture, the Centre for Research on Education, Training and Employment, the Institute of Research in Education, the regional council, the Rectorat (the service of the national education system), the National Institute of Statistics and Economic Studies. From 2002, OREF received assistance from the regional centre of resources. As for organisational structure, the steering committee, the heads of regional services of training and employment determine the work programme and main topics of studies. The technical group, which consists of experts from the above institutions, is in charge of analysis of regional problems and carries out research projects. In a political and regional context, this OREF network has changed since 2004.

OREF's activities are structured around four themes:

(a) initial and continuing training;

(b) territorial dimension of the training-employment relationship;

(c) graduates' careers;

(d) qualifications development.

Based on an interinstitutional network, OREF aims to coordinate the work of different institutions and services in the region. The main purpose of OREF Burgundy is to stimulate and support the process of reflection, to develop instruments of analysis and forecasting, and to organise an interaction of different State services and the regional council.

At the same time the regional training and employment observatories (OREFs) were created. They were supposed to be an instrument to help regional actors in decision-making processes. Regional observatories were established in France at the end of the 1980s, at the beginning of strong decentralisation. Such a situation led to the progressive transfer of responsibilities to regional authorities for training and revealed the necessity to strive for coherence and encourage regional and national institutions to be complementary. To avoid supplementary and redundant questionnaire surveys, the idea was to use existing data available in different services and to encourage State institutions and regional councils to work together. Created in 1989, the OREF Burgundy aims to make data on employment and training available to help regional and local actors take decisions.

2. Skill needs analysis in the hotel and catering sector

Work carried out in the framework of the contract of objectives in hotels and restaurants is an example of mobilisation by public and private actors, of qualitative and quantitative data on training, employment and professional integration in the given economic sector. The contract also reveals the strong points and limits of the process of negotiation between public regional actors and professional organisations. Which institutions are responsible for the phases of the skill needs identification cycle? What are their strengths and weaknesses?

The decentralisation that has been taking place for the past 20 years, has brought considerable changes in the territorial approach to the relationship between training and employment. New actors have appeared or the role of some has been reinforced. The contract of objectives in hotels and restaurants mobilises four main actors who take more or less active parts in its execution:

(a) the regional council ([63]) is responsible for establishing a regional plan of development of vocational training for youth (initial and continuing training, apprenticeship). The service for apprenticeship and continuing training is in charge of developing these contracts in Burgundy;

(b) the State unites two different institutions in the region, the Rectorat (Ministry of National Education), in charge of developing a *carte scolaire* (school establishments planning), and the Regional Board of Labour, Employment and Vocational Training (Ministry of Labour);

(c) the FAFIH is a joint institution that collects funds for vocational training (apprenticeship and continuing training) in the hotel and catering sector ([64]). It is represented by professional organisations in the hotel and catering sector and it forms a national structure (a national secretary, an official charged to study in the national observatory) with regional representative institutions.

2.1. The regional council

The principle function of the regional council is to steer as an organiser. Stipulated by law, the role of regions is to be 'pivot' actors, leaders for coordinating all the training operators in a

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([63]) A regional council is an assembly of members elected by popular vote is charged to manage regional affairs (there are 22 in France).

([64]) In France, enterprises are obliged to finance continuous professional training for their workers and they may transfer some subsidies to this institution. These amounts are in proportion to the salary mass of the enterprise.

regional plan for training development. Its function in Burgundy is simultaneously to plan and optimise use of its financing. The regional council in Burgundy does not possess a research service, it does not provide any statistical information, except data on activities financed by the regional training programme (number of training courses or trained people). Given the absence of gathering statistical information, the main goal is to bring a methodological basis, specify existing challenges for all partners, and manage the regional system of vocational training.

At the same time, three limits appear:

(a) an excessively segmented management of the system of training that includes apprenticeship, vocational training for youth and vocational programmes with school status, training courses for adults, higher education;

(b) an insufficient number of evaluation procedures;

(c) absence of available information on characteristics of trained people who followed vocational programme financed by the regional council.

2.2. The Rectorat

Besides the functions of public service (to ensure education for all groups of the population), the mission of the Rectorat is to implement at academic level the policy of the Ministry of National Education and to modify the *carte scolaire* (school establishments' planning). The ministry's policy aims to achieve a wide range of objectives, such as an access to level IV (ISCED 4) of 80 % of the age group, to ensure that all graduates obtain a diploma of level V (ISCED 2-3) minimum, to deal with professional integration of youth, to update the content of vocational programmes to meet the needs of the labour market, to control the equal opportunity of access to training programmes throughout the territory, etc.

The function of the Rectorat is mainly to justify decisions taken at national level on the situation at local level; it is a matter of political, economic and social conditions. This institution has a research service (academic statistics service) and it provides multiple data on school demography (on school status and apprentices), establishments policy and professional integration of young people trained (decentralised survey *insertion vie active* [integration of young school-leavers]).

The methodology needs to be adaptable, because under constraints or for other reasons it is necessary to consider the local context (enough people to continue to the next vocational education levels, the existence of pedagogical groups that are competent to teach courses of recently developed vocational programmes) and the conditions of the whole territory. The Rectorat can use the *carte scolaire* in its work, the system of follow-up of students in school and out of school, and information on social demand by analysing pupils' and families' wishes. Three conditions limit the capacity of expertise of the Rectorat:

(a) absence of permanent and well-organised ties with the labour market;

(b) weakness of social and economic argumentation to support the opening or closing of sections (in spite of a directive framework);

(c) difficulty to arrange critical debate on analysis of professions.

2.3.   The Regional Board of Labour, Employment and Vocational Training

The role of the Ministry of Labour at regional level is to deal directly with financing the system of continuing training, as a result of decentralisation in 1983 and 1993. Participation of this institution has a strong institutional character (representation of the State in the regional council for continuing training) with mediation between different partners.

The Regional Board of Labour, Employment and Vocational Training has at its disposal an important research service that provides reliable data on essential labour-market indicators, such as the demand and supply of employment, labour-force turnover, etc. Its role is that of 'facilitator' to:

(a)   provide different types of data (depending on particular demand);

(b)   assure the legal validity of some measures in accordance with the Labour Code;

(c)   overcome prejudicial obstacles to ease discussions.

The Regional Board of Labour, Employment and Vocational Training is guarantor of dissemination of information.

2.4.   The OREF Burgundy

The presence of OREF Burgundy is justified as no institution at regional level is able to manage alone the relationship between training and employment. The process of networking includes organising cooperation between experts in different institutions, sharing available information and carrying out analyses. The role of OREF Burgundy is to encourage and support a process of reflection. Its expertise is not to provide an argument for decisions made *a priori*, but from observations of real situations to suggest future development and to propose indicators to help decision-making. The OREF network does not produce statistical information. It uses data on training, employment, unemployment, etc., coming from different institutions in the network. Further, for the hotel and catering sector a qualitative survey among 50 enterprises complemented available data.

The methodology includes two instruments. The first is to organise available data on the relationship between training and employment deploying national instruments (CEP, Céreq surveys) or statistics provided by relevant regional institutions. The second is to analyse data in view of future trends and developments.

For hotels and catering, the approach of OREF is composed of four stages. The first stage is to know the quantitative developments measured by chronological analysis of the demand and supply of work. The analysis should cover a 10-year period to determine if the situation worsens or not, whether it is a matter of the economic structure or the overall economic situation. The second stage follows professional paths of trained people; this finds the links between the vocational programme followed and the job occupied. The objective of the third stage is to get acquainted with recent qualitative evolutions by interviewing managers of enterprises to find out the evolution factors of workplaces in the sector, the policy of recruitment, competences and skills required referred in the CEP. The fourth aims to validate and enlarge the projection: a team composed of public authorities, professional organisations and OREF is in charge of this.

There are two main advantages of OREF's work. First, it provides multidimensional analysis of training-employment variables that enriches the work thanks to the multiple points of view. Second, as a consequence, it reinforces the capacity of expertise of the region and deepens the discussion through analysis that does not depend on only one institution.

There are three essential limits: a network that can be negatively influenced by the complexity and length of interaction between different institutions; the compromising effect due to negotiation between experts; and the low impact of the analysis on the process of final decision-making by regional authorities (it is a matter of a regional policy).

2.5. How to identify skill needs for a specific occupation?

The third stage of OREF's activity is to identify qualitative evolutions in the hotel and catering sector based on the report prepared by national CEP ([65]) and complete it with a regional survey carried out among entrepreneurs. To evaluate skill and training needs in a specific occupation, it is sufficient to find out the current policy of recruitment and training, define required competences and qualifications, and determine technical evolutions and work organisation. The objective is to deploy the results obtained at national level in planning at local level. This economic sector employs about 21 000 workers in Burgundy, representing 3.4 % of all workplaces in the region (in France, generally, this sector represents 3.5 % of all workers).

The CEP determined numerous factors that will have direct or indirect impact on the sector's structure in future:

(a) the population structure and changing way of life: the growing importance of leisure, environment, location of restaurants, prices in accordance with quality, packaging and labelling of products, new way of time management, etc.;

(b) 'caprices' of demand: the hotel sector is no longer the dominant form of tourist accommodation and it will face competition from other forms of accommodation (*gites*, bed and breakfast, camping, etc.), apart from traditional hotel services, new forms of services appear (e.g. thalassotherapy);

(c) the influence of technologies: information management leads to automation and more efficient organisation of room cleaning, room allocation, reservation facilities, etc.;

(d) changes in work organisation: in the restaurant business, changing patterns of distribution of dishes prepared in the restaurant kitchen and preparation of ready dishes, etc.; the hotel business turns to subcontracting for cleaning and laundry, and the importance of multitasking is growing.

The regional survey conducted among 46 managers in hotels and restaurants ([66]) shows the place of the Burgundy region in comparison to national evolutions. In general, employers do not mention any development in occupations or in the hotel and catering sector. The main point is

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([65]) In the CEP about the hotel and catering sector in addition to standard statistical data a specific study was conducted among 16 enterprises, 472 independent entrepreneurs and 1 100 employees (*Ministère de l'Emploi et de la Solidarité*, 1997).

([66]) The questionnaire was carried out by telephone in accordance with the list of enterprises of the Côte d'Or. The response rate was about 98 % by telephone; each interview lasted on average 15 minutes.

that the changes, noticed by these managers, do not lead to radical transformation of occupations: 'We provide traditional food service and that does not change a lot […] It is a matter of adapting to new requirements, in particular, clients' requirements, to new norms (hygiene and food security)' (NO-NTF, 2001). Changes cited by employers concern requirements of customers demand for prices, quality and services: 'client is a king', 'dishes to take away', 'modern attractive cooking of good quality', 'gourmet cooking', 'vegetarian cooking', etc.

The only important point regarding new competences is introduction of new technologies, and, in particular, informatics (Internet) that has a direct impact on reception staff who are expected to be multiskilled, have a knowledge of foreign languages and be familiar with a computer and fax. Other changes noticed were conditions of work for cooks (timetable, wages). During the survey, the issue of double competences emerged (waiter plus accountant, housekeeper plus waiter), particularly in small firms.

The main trends revealed during the national CEP were confirmed by the regional survey. The conclusions of the regional survey coincide with the results of the CEP of 1995, revealing the same issues: demanding customers, problems of hygiene and food security (European norms), increasing importance of informatics (Internet, intranet), and constraints of work.

2.6. The professional branch of hotels and restaurants

The national fund for training in the hotel and catering sector (FAFIH) participated in the first contract signed in 1995 ([67]). Analysing meetings' reports and documents provided by FAFIH, the main function appeared to be control of the training system: regulation of flows of trained people. This is revealed in analysis of the vocabulary, where the word 'profession' is often used ('according to the opinion of the profession', according to 'the needs of the profession') even if a clear definition is never provided. FAFIH, favours development of apprenticeship and wishes to decrease the number of young people in *lycée* because training of two thirds of them is financed by the Ministry of Education (according to FAFIH Burgundy prepares too many cooks at school and not in apprenticeship!).

On the control function performed it is possible to hypothesise that FAFIH experts explain decisions made *a priori*, to justify existing national policy choices. To do this, the institution uses its own statistical survey, the CEP conducted at national level, according to the size of the hotel and catering sector in Burgundy (sampling according to the regional distribution by size of enterprise, by type of activity in the hotel business considering the evolution of the number of workers during a year). Second, it carries out a table of relationship between training and employment deploying the following indicators: number of workers, number of trainees, annual estimated needs, number in excess.

([67]) The contract of objectives was supposed to expire in 1998. Annual additional clauses based on outcomes of the preceding year were supposed to describe modes of application and evolutions of the contract of objectives regarding flows, levels, territories and programmes of information dissemination and financing. In our opinion, no additional clause was developed. Moreover, negotiations for a new contract took place without any evaluation of the first contract. In the previous contract, however, it is stipulated that 'a global outcomes evaluation is to be effect during the last year of the contract duration' (Article 11).

The advantage of the national FAFIH is to provide continuously updated information on occupations for one part of the sector. There are different types of limits. First, sufficiency of the 'mechanical' approach has been lacking since the 1970s. In the present case, data are provided without explaining calculation methods used for estimated annual needs and numbers in excess. Moreover, the proposed analysis denies the complexity of the process of integration of youth and neglects the effects of interregional and intersectoral mobility. Finally, the representativeness of FAFIH for enterprises in the sector, with cafés-hotels-restaurants, fast-food restaurants, big hotel chains and tourism agencies being excluded ([68]).

3. Among actors with different opinions

Developing the contract of objectives brings together different economic actors and public decision-makers in training and employment (State, Rectorat, regional council, professional branches). OREF contributed the idea that analysis of skill needs cannot be treated independently, either from the policy of human resource management perspective (e.g. turnover in hotels and restaurants), or from the tightness on the labour market perspective.

The contract of objectives should improve dialogue and decision-making management between different actors. However, these bodies, including professional syndicates, have a national vision of sectors and professions. In general, national actors wish to find different forms of adequacy between work positions and training using the contract of objectives as an instrument of coherence and negotiation at regional level.

The contract of objectives aims to cross two types of approaches: the first is national by sector, the second is regional. To what extent is sharing information possible between regional actors whose interests are sometimes guided by contradictory objectives? Contracts of objectives are developed considering several necessities that do not follow the same logic: the administrative 'public service' logic (necessity to provide school education according to national objectives), regional planning logic, sector-based logic, etc.

The first difficulty comes from the biased opinions of FAFIH that underline the importance of close ties between the flows of trainees and their own needs. At the same time, numerous research projects at national and regional levels show that the hotel and catering sector is not currently able to employ all young people qualified as cooks. Other sectors (canteens, health establishments, services for individuals) need this type of labour force and represent half the recruitment in the cooking field. The situation is made worse by the absence of efficient guidance for professional choices of trainees.

It was necessary for OREF to oppose the approach that led the professional branch to confirm that Burgundy prepared too many cooks because half the graduates work in other sectors. For instance, FAFIH would like to train fewer trainees to oblige them to stay and work in hotels and restaurants. But decreasing trainees will not imply more workers in this sector, on the contrary.

([68]) Several questions arise: how can it be ensured institutionally that an organism collecting funds for professional education (1.5 %) and also managing these funds, represents the whole profession? Is it to compensate a deficit of organisation of equal representation? Is it due to the extensive character of this sector (hotel chains, traditional restaurants, collective restaurants, etc.)?

There is a big risk for this approach that aims to balance mechanically the flows of trainees and the size of only one sector, and neglects individual behaviour. It is essential to mention that the hotel and catering sector is important for employing young people. However, by observing the labour-force turnover, it is clear this sector cannot continuously keep the young in employment.

4. Transfer into policy and practice at local level

The actors in training and employment, the State, regional administration, enterprises and individuals have at their disposal some freedom they use more or less coherently and in agreement with their associates. To bring institutions that sometimes compete to share points of view and organise a common activity is a task to be achieved in the future. Considering differences between the logic of various institutions (the State, regional council, professional syndicates, training institutions) the question is whether a common position on future skill needs is possible at all. Being eager to answer this question, we will give a concrete example, broken down into four parts.

4.1. The regional council's request

While preparing its annual vocational training programme, the regional council of Burgundy issues a call for a project. Vocational education and training institutions in reply to the call should provide arguments for their proposal in accordance with analysis of their social and economic context. The regional council makes sure there is an opportunity to carry out vocational training proposed by a training centre for a particular occupation/sector in the region. Nevertheless, this vocational training centre continues to take as a base the survey realised at local level among the main hotels and restaurants that reveals a lack of cooks and a necessity to prepare a new trained labour force. To clarify the situation the regional council solicits the expertise of OREF.

4.2. OREF analysis

Regional observations made within the framework of the contract of objectives show almost half the cooks leak to public and private services. In other words, the problem is not training too many cooks but that traditional hotel and restaurant businesses cannot keep them.

National data confirm there are good conditions of access to workplaces in different sectors that use qualified cooks.

Statistical data on cooks' employment in the region show there is local-market demand and that unemployment among cooks is limited and short term.

4.3. FAFIH analysis

The recent study projects carried out in appropriate training/employment confirm the position of the social partners who currently discourage qualifying vocational programmes that prepare cooks.

A table drawn up in Burgundy on employment/training states that, in general, regional training establishments train more qualified young people than enterprises need, especially in cooking professions, where the number of qualified workers largely exceeds demand.

4.4. The final decision

The regional council decided not to use this multisource analysis carried out by OREF and followed the opinion of FAFIH. While the regional council solicited an opinion from OREF, this same institution finally followed FAFIH's recommendations. By this FAFIH fulfils its function of control ratified by the regional council without more thought over the proposed analysis. However, this decision is based on different contradictory arguments: to demonstrate proof of success of its activity for the regional council it is essential to reinforce the links with FAFIH. The relations between the regional council and FAFIH shaded the expertise of OREF that was nevertheless solicited by the regional council ([69]). Two institutions involved in the multidimensional analysis stay distant. The FAFIH initiative justifies national political decisions, implements them at regional level, makes these proposals validated by public policy-makers rather than base its reflections on and draw conclusions from observations of the real situation.

In conclusion, instead of establishing a mechanical and quantitative relationship between needs and training, we must adjust these two components. The skill needs identification must focus on detailed analysis of existing, quantitative and qualitative data and on confronting the viewpoints of different actors to develop a shared diagnosis to promote policy and practice based on such diagnosis.

This regional example points out different aspects. The first is the influence of control strategies on decision-making: this leads to significant differences in analysing skill needs. The second risks institutional inertia in the region. One major challenge for regional councils in the future is to establish their own capacities to produce shared diagnoses. The third concerns the role of the expertise offered by an institution such as OREF. To deepen knowledge of the training-employment relationship is, without doubt, a necessary and useful objective for decision-making in involved institutions, but it is important to mention that this expertise will be less considered the stronger the combination of actors' politics.

([69]) While the training centre did not get financing for a training programme for cooks from the regional council/ FAFIH, the local agency for employment had its own vision of the lack of cooks and financed the education of those who wished to get it.

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Table 1: *Analysis of the regional system, institutional framework and process for identifying skill needs in Burgundy*

Institutions/actors	Dominant logic	Expertise	Process	Strengths and weaknesses	
The regional council	Leadership	To plan and optimise use of financing	No research department • data on training programmes financed by the regional council	• policy of administrative management of training instruments	• absence of evaluation • too segmented services • refers to an opinion of the professional medium
The Rectorat (Ministry of Education)	Implementation of national policy, elaboration of the *carte scolaire* (school establishments plan)	To justify decisions made based on local data	Existence of a research department • number of pupils and trainees, data on professional situation of trainees • elaboration *carte scolaire* • Follow-up of national orientations	• following pupils' paths in the education system and their integration into the labour market • knowledge of social demand	• lack of permanent social and economic indicators to justify opening and closing vocational training courses • no links with the labour market
Regional Board of Labour, Employment and Training (Ministry of Labour)	Institutional mediation	To determine and comprehend elements of analysis	Existence of research department • data on employment and unemployment	• guarantee of dissemination of institutional information (Labour Code)	• absence of initial and continuing vocational training analysis
OREF Burgundy	To analyse data on supply and demand and the relationship between training and employment to support decision-making processes	To elaborate diagnosis	Statistical data from different institutions in the network; identification of skill needs based on chronological and comparative analysis using available data on links between training and employment with help of: • qualitative survey among 50 enterprises, • national CEP.	The richness of interinstitutional analysis that does not depend on or defend only one institution's opinion	• complexity of interinstitutional work • reductive effects of compromise • limited influence of OREF's expertise on decision-making
FAFIH national	Control of training	To justify and explain national choices made *a priori*	• sector-based and mechanistic/ quantitative approach by creating table of training-employment relationship • skill needs based on CEP	Knowledge of professions in part of the sector	• absence of identification of the mode of calculation of data • limited representation FAFIH of the entire sector

Transfer of research results into policy and practice – on the road to implementing research: some observations and conclusions based on Germany's network of early identification of skill and qualification needs

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The focus of this contribution is on transferring research results into practice. It refers to observations and conclusions based on experience from the German research network on early identification of qualification needs FreQueNz and on experience from other research projects in education. Starting with a short description of the German research network, the author points out main target groups and modes of transfer of research results into policy and practice of various network partners. It shows successful factors and problems of transfer and the impact of research results. It ends with some conclusions and suggestions in a medium-term perspective for establishing a systemic approach for transferring research results and implementing research.

1.   Introduction

The focus of this article is on transferring research results into practice. It refers to observations and conclusions based on experience from the German research network on early identification of qualification needs FreQueNz, financed by the German Federal Ministry of Education and Research (BMBF), and on experience from other research projects in education. Starting with a short description of the German research network and ending with an outlook from a medium-term perspective the article deals with four main issues:

(a)   transfer of results – to whom?

(b)   transfer of results – how?

(c)   impact of results;

(d)   some conclusions.

Although the author is a member of the FreQueNz network, this article does not express an 'official' position of the network. The observations and conclusions are a combination of empirical results and personal evaluation and interpretation by the author.

The FreQueNz network is based on the assumption that companies, employees and training providers as well as the social partners and experts dealing with regulation of initial and continuing vocational training (CVT) are dependent on immediate and future-orientated

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information regarding skill development. Consequently information from the network is directed at these different 'key players'.

To approach this difficult task, a network of presently 11 institutions was established and financed by BMBF. Corresponding to the variety of tasks the network covers quite different members which can be classified in three main groups:

(a) experts representing social partners: the German employers associations (KWB) and the trade unions (DGB);

(b) experts from the German Federal Institute for Vocational Education and Training (BIBB), dealing with regulation in initial education and training and CVT as well as with research in this field;

(c) 'independent' research institutes with experience in education and labour-market research which are not directly linked to the social partners or administration.

This variety offers high potential in a network perspective: the partners not only use different approaches and methods and focus on different levels of analyses; they also differ in their key profiles. Experts representing social partners have, for instance, well-established links to transfer their results into practice in many fields but their research issues are closely linked to organisational priorities. 'Independent' institutes, on the other hand, may find transfer of their results into practice more difficult, but have a much higher degree of freedom in identifying relevant research topics and presenting results. The network offers the opportunity to combine the advantages of the different profiles at least to some extent, although different views between interest groups will never disappear entirely in a network.

The main focus of FreQueNz research activities is on employees with a middle qualification level, mainly apprenticeship in the dual system or comparable vocational school qualification. In contrast to other countries such as France, apprenticeship in the dual system in Germany is not primarily directed at disadvantaged or handicapped youth. It still is the most frequent regular vocational qualification of young people, chosen by roughly 60 % of the age group, although this share has been decreasing in recent years. In international comparison this qualification level would be classified as ISCED-level 3 or 4.

All in all the basic objectives of the German early identification initiative are:

(a) a more efficient recording of market changes to permit more rapid regulation responses;

(b) recommendations for action;

(c) contribution to vocational training research.

The aims of FreQueNz have varied in different phases. In the initial phase the main focus was on methodological issues, dealing with tasks such as developing methods and research approaches and transfer aspects which were more or less an add-on-value. Later, when methods and approaches had been established, transfer of results became one of the main tasks of the network.

2.   Transfer of results – to whom?

Different target groups often have different information needs. So the first two questions on transfer activities of the network are:

(a)   to which target groups should results be transferred?

(b)   who are the first-priority target groups?

The FreQueNz-network faces various user groups (Figure 1). In a first approach, they can be structured to three groups:

(a)   institutions involved in regulating vocational education and training (VET);

(b)   supply and demand sides of VET;

(c)   the public.

Figure 1: Partners and users of FreQueNz

Source: Schmidt and Steeger, 2004.
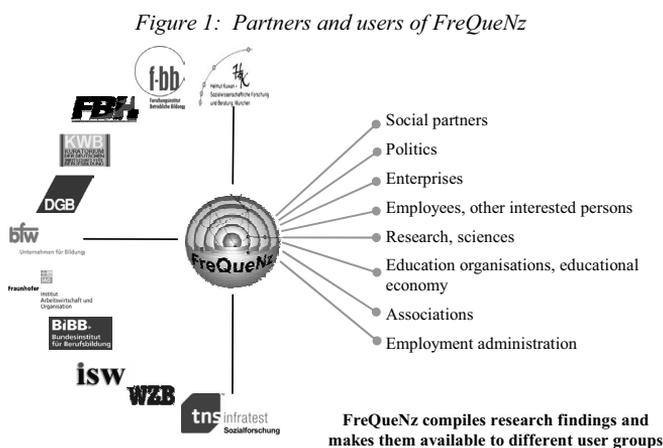
2.1.   Institutions involved in regulating vocational education and training

There are different institutions regularly involved in this process. Above all, these are the social partners, government (e.g. federal ministries, *Länder* ministries, BIBB, trade chambers – *Kammern*), professional organisations and trade associations (*Berufsverbände*). Their roles vary according to the sector addressed, for example, apprenticeship, vocational schools, CVT, etc. ([71]).

2.2.   Supply and demand sides of vocational education

The major groups in this field are (potential) participants of initial vocational education and CVT, above all school-leavers or employees and unemployed, as well as employers, education and training providers, employment offices, etc. Although the social partners represent employers and employees, the latter have to be addressed directly. Especially in newly emerging

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([71]) It would take more than the pages available for this article to outline the complicated structure of responsibilities within the German vocational system.

sectors the social partners are often not as strong as in traditional ones. The second reason is that even in fields where the social partners are well established, not all agreements between them are equally accepted by their clientele.

Therefore, transfer of research results into early identification of qualification needs for a new profession or training field is a crucial prerequisite but it is not an exhaustive successful transfer of research results. A more adequate indicator which is also more difficult to obtain is acceptance by education and labour markets.

2.3. The public

This group is formed mainly by individuals interested in research results, counselling and guidance and vocational orientation. Further, it encompasses science, sectional professional journals and sometimes newspapers and mass media, if the research topic is of general interest and not restricted to a specific field.

2.4. Varying roles and target groups in transferring research results to network partners

As mentioned before, transfer priorities as well as the potential of network partners differ to some extent. The social partners (KWB and DGB) are generally involved in most regulatory activities. Nevertheless, big organisations are not homogeneous blocks. So even in these cases transfer has to be initialised and supported, for example, by transferring results from the research department in BIBB which is member in FreQueNz to the regulation department.

The starting positions for transfer activities of 'independent' institutes vary between research approaches. Researchers who try to identify future skill needs by examining changes in the workplace may find that transfer to companies is easier than those looking at changes in educational supply. Some researchers on the other hand consider the scientific community their main target group as the guidelines of their institute set this priority; so their main aim could be called transfer to science.

Again the possibilities resulting from combining different starting positions, approaches and potential of FreQueNz members are bigger than the sum of individual input.

Except for social partners and BIBB it is not a high priority for most members of FreQueNz to become a direct key player in regulation; rather the aim is to become a primary information source for regulation processes. This aim is less modest than it may appear. In regulation processes where new arrangements often affect the influence of interest groups not every expert is longing for information from outside well-established 'inner circles'.

As social partners and professional confederations are not equally strong in each of the sectors examined by FreQueNz, especially in innovative, emerging sectors FreQueNz researchers may support the regulation process in a different way: by helping to identify the organisations and key experts to be involved in the regulation process.

3. Transfer of results – how?

Corresponding to the variety of target groups the FreQueNz network uses various information tools and activities to present research results. The following section gives a short overview of transfer activities and target groups. First impressions of the impact of these activities are described in Chapter 4.

Important transfer channels of FreQueNz are:

(a) a web-based electronic platform with information on research results and many other functions (www.frequenz.net);

(b) a book series with 11 volumes to date;

(c) a newsletter published every year, available in print and by e-mail, with short articles from ongoing projects;

(d) conferences, workshops and discussions.

These activities characterise the frame of the network. In addition, all partners write articles in professional and scientific journals or books, make presentations at various conferences and workshops and participate in further discussions.

The importance of the different transfer channels varies for different target groups. According to the author the best way to provide input to regulation processes are personal discussions with the experts involved. Transfer to companies is mainly discussion-based as well but workshops with mixed groups (e.g. experts from companies, researchers, government) also play an important role. The printed newsletter, too, is well-accepted by companies as a medium of information transfer. About 700 companies from the sample of the ADeBar-project ([72]) receive the newsletter. Science and the public are mainly addressed by printed media, the electronic platform and conferences.

For a target-oriented transfer of results it is also important to identify new stakeholders (e.g. for emerging technologies) and to address 'process owners' in the regulation system.

4. Impact of results

This contribution was prepared for the workshop 'Transfer of skill identification results to policy and practice: systemic solutions'. The workshop title clearly identifies the need for systemic solutions as a key question for transfer activities. Although the FreQueNz network gives various input to the vocational education system in Germany, these activities at present are far from being systemic solutions. As stated before, FreQueNz does not intend to change regulation processes or to substitute its 'key players'. With this in mind establishing some new system-conformed transfer structures nevertheless might be helpful.

([72]) The ADeBar project – permanent close-to-the-job observation of qualification needs, aiming at an early identification of changes at the workplace and within enterprises – comprises a combination of qualitative and quantitative surveys and of longitudinal and cross-sectoral analyses. A change in qualifications and qualification needs becomes obvious with a time lag in many areas: in vocational training, in the continuing training market, in the labour market – but first of all at work itself.

To measure the impact of research results on the vocational education system in general is a difficult task although there are some exceptions when an impact is more or less obvious, for example, when social partners or BIBB are involved in both research and regulation or when new CVT courses are developed in cooperation with researchers. Examples for the latter are development of a new professional qualification 'medical wellness trainer' by the Institute for Structural Policies and Economic Development (isw) which started in two German *Länder* or a CVT module in *Brennstoffzellen*-technology by Fraunhofer Institute of Industrial Engineering (Fraunhofer IAO), so far attended by about 1 600 participants.

Usually the cause-effect-chain, however, is not as clear. This may be illustrated by the discussions connected with modernising initial vocational education in office activities encompassing commercial and administrative functions (*Kaufmännisch-verwaltende Bürotätigkeiten*), one of the biggest sectors of initial education in Germany. As this field was a research focus of the ADeBar project carried out by Fraunhofer IAO, TNS Infratest *Sozialforschung* and Social Research and Consultancy Munich, the results were submitted to the social partners involved in the modernising process. Researchers were invited to several discussions and workshops by one of the social partners.

Despite this involvement some aspects of the transfer process remain a black box to researchers: Which aspects of the results will become priority issues for this social partner in ongoing negotiations? And which results will finally become part of the new regulation? Even if a comparison of the new regulation and research results showed many corresponding topics and priorities this would be no more than 'soft evidence' for transfer success. The experts involved in regulation are able to answer this question more precisely but it would take quite an effort to obtain this feedback for every transfer activity of FreQueNz.

Use of research results by experts involved in regulation can be considered as a first soft indicator for impact. As stated before, readiness to open doors for external input to inner circles of regulation varies between fields as well as between persons. According to the author's personal experience which is just another 'soft indicator' there has been a remarkable change in the reception of research results of FreQueNz within the past two or three years. The main question of researchers has shifted from 'what can we do to support reception of our results by experts involved in regulation?' to 'do we have enough time to answer all requests?' ([73]).

So far the activities of FreQueNz have not led primarily to identification of completely new professions in initial vocational education, and there is good reason for that. Although the need for lifelong learning is broadly accepted, in Germany there is still an identification of individuals with the profession of their initial vocational education that is unusually strong when compared internationally.

Future-orientated studies such as the German *Education-Delphi* indicate that this strong connection between social and professional identity will decrease only slowly (Kuwan and Waschbüsch, 1998). Consequently, Germany offers a solid but rather static variety of professions in initial vocational education and development of a new profession is considered an

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([73]) As this phenomenon seems to describe the situation of network partners in general this leads to the question of whether or not there should be some adjustments of the strategic position of FreQueNz .

extremely difficult task with consequences far beyond mere occupational aspects. Therefore, innovation takes place more often by modernisation of existing initial vocational education and, even more, in the CVT field. This is true for the transfer activities of FreQueNz as well.

Which factors beyond the quality of results support the success of transfer activities into initial vocational education and CVT? The following three aspects, far from being a systemic approach, reflect experience of the author and should be considered no more than a first approach to this question:

(a) open-mindedness of the experts involved in regulation;

(b) good reputation of researchers and institutions involved;

(c) a generally accepted need for information which seems to be found more often in newly emerging fields than in traditional ones.

5.   Some conclusions

FreQueNz offers many advantages to members and to users of information. Exchange between research groups is supported, which gives more opportunities to learn from others. Combining different approaches provides a multiperspective cross-examination of results which is essential in a complex and innovative research field. Last but not least, the network supports transfer activities of all its members.

All these activities are helpful and should be continued. In addition, future activities should include three priority aspects:

(a) a systematic selection of research topics;

(b) a broader framework for transfer activities;

(c) further strengthening of the European perspective.

5.1.   Systematic selection of research topics

Future-orientated research helps to identify information on upcoming technologies, sectors and innovation. For FreQueNz it would be helpful to analyse the information systematically to identify new research fields of the network.

5.2.   Broader framework for transfer activities

As stated before, FreQueNz does not intend to change the vocational regulation system in Germany or to substitute regulation experts. Still, it might be helpful to create a broader framework for transfer within the given system. One way might be a general information link, provided by BMBF or BIBB where regulation experts are continuously informed on research results and experts from FreQueNz in their fields. Another way might be to create regular sector councils where experts from the social partners, companies, CVT-providers, FreQueNz and others discuss future skill needs.

5.3. Strengthening the European perspective

Early identification of skill needs has become an increasingly important issue on the European agenda. With Cedefop-Skillsnet, FreQueNz started at an early stage European conferences and workshops. Due to financial constraints their prompt response to real needs has so far remained limited. In future a European network perspective should not be considered a side-line but a central focus of research and transfer activities.

6. On the road to implementing research

Section 5 presents some conclusions for the near future. In a medium-time perspective a few more steps are necessary.

Most transfer activities of FreQueNz refer to CVT and often transfer starts with pilot projects. Therefore, it is necessary to deal with a problem which many pilot projects and programmes in Germany and in other countries (see the contribution by Hilbert in this volume) have to face: 'successful failure'.

The term 'successful failure' is used to describe a situation when pilot projects or pilot programmes succeed in reaching their primary goals, sometimes confirmed by external evaluation. However, transfer into the regular education system fails. Approaches remain 'island' solutions or disappear completely.

What are the reasons for this? And how can implementation of successful pilot actions be supported? These are key questions of implementation research, a field not covered systematically in educational research in Germany and probably in some other countries as well.

Although it is not possible within the given frame of this article to describe this field in detail some basic aspects can be outlined:

(a) implementation research aims to identify barriers for a broad application of successful innovations. Specific questions might be: are the main barriers to a specific innovation a lack of information? Is it a problem of communication? Do interest groups resist change?;

(b) thus implementation research also includes a new role for scientists at least in some countries (British scientists might be more familiar with this). Scientists have to cross the borders of 'inner circles' of their profession and communicate with decision-makers and the public. New forms of communication are needed and scientists have to cope with interdisciplinary approaches and public understanding of science;

(c) implementation research is different from action research. Supporting the position of one target group is possible but not necessary for implementation research. Moderating or mediating processes are possible as well;

(d) implementation research is also different from evaluation although in its initial phase it is often based on results of evaluation. It covers issues such as decision processes in the public sector and in enterprises, communication processes, analysing actions of interest groups and finally change management in policy research.

Research on early identification of skill needs will often initiate change processes in the educational field. In a medium term perspective researchers will find themselves moving on the road to implementation research.

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New developments in the early identification of skill needs in Austria: the AMS skills barometer

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So far no observation instrument for the early identification of skill needs has been developed in Austria, mainly due to a lack of good macrodata on qualifications and occupations. There are some regular forecasting activities and many ad hoc studies have been done on specific branches or topics. Recently new instruments have been developed and better data are expected soon. There is a tendency to link skill needs analysis with quality assurance initiatives of education providers, and a trend towards presenting expert knowledge on skill needs to individuals. The latter trend is best exemplified by the AMS skills barometer, the first comprehensive online information system for developments in qualifications and job-market requirements in Austria. Trends in demand are represented according to 24 vocational sectors, 94 vocational fields, 600 occupations, and up to 5 000 different skills and competences.

1.   Status quo and new approaches in Austria

1.1.   Current approaches

Until recently, Austria could not claim to be innovative in early skill identification. But the past few years have brought some remarkable initiatives deserving international attention. To begin we describe the current Austrian situation, discuss its major deficits, then point out innovative approaches. Finally, we introduce one of the new instruments: the AMS skills barometer.

1.1.1.   Regular surveys

Until recently, only two regular surveys worthy of mention were undertaken in Austria: *Micro-prognosis* (Synthesis, 2003) and *Lehrlings- und FacharbeiterInnenprognose* (projection for apprentices and skilled workers) (AMS, 2003). Both were commissioned by the Austrian labour market service (AMS), the latter being undertaken by AMS itself. Unfortunately, for forecasting future skill needs both surveys were not satisfactory.

The *Lehrlings- und FacharbeiterInnenprognose* mainly tries to foresee supply, meaning it forecasts the probable availability of apprentices based on existing numbers and demographic trends. It does not say anything about demand for apprentices, let alone their expected skills and competences.

The micro-prognosis is a short-term forecast on manpower demand, only roughly differentiating between occupational fields (represented by combined ISCO groups). There are no details on technical skills or personal competences in demand. The only information given on individual occupations is whether they are threatened by unemployment. Offering only general guidance

on labour-market trends, the micro-prognosis is not a tool for planning vocational education and training curricula.

1.1.2. Ad hoc studies on skill needs

On average one or two ad hoc studies on skill needs are undertaken in Austria per year; these are more or less publicly available. Most of these studies are commissioned by the AMS, some by the Federal Ministry of Education, Science and Culture, the Federal Ministry of Economics and Labour, the Austrian Federal Economic Chamber, the Chamber for Employees' Welfare, individual federal provinces and communes. Focus and frequency of these studies vary according to political demands; for example 1999-2001 analytical and prognostic activity for IT-personnel increased considerably. Basically the spectrum of studies is wide, ranging from medium-term estimations for skill needs in individual Austrian provinces, over-qualification deficits in SMEs of selected regions, to prospective skills profiles for individual educational fields (e.g. university graduates), trades and industrial sectors. All these initiatives share common ground – a comparative analysis of 13 studies ([74]) undertaken from 1994 to 1998 characterises them as follows: 'These studies are oriented on sectors rather than regions [...]. Only very few of them differentiate between sizes of enterprises. Gender and age variations are mostly neglected as well. When using official statistic data the time frame of analyses usually comprises the last two census [authors' remark: in 1981 and 1991]; the prognostic time frame usually is much shorter, mostly short term (one year) or medium term (five years)' (Hörtnagl et al., 1999).

1.1.3. Forecasting demand for Fachhochschul-study courses

Forecasting demand for *Fachhochschul* ([75]) graduates is part of the accreditation procedure and quality assurance system of Austria's *Fachhochschul* system. A new study course cannot be launched without having its future graduates labour-market chances evaluated by an independent institution. The first of these prognoses was undertaken in the early 1990s using very different methods. Altogether around 250 to 300 feasibility studies were commissioned during the past decade. Most ended up as a supplement to the respective applications for official approval by the *Fachhochschul* Council and were never made publicly available.

Forecasting demand for new *Fachhochschul* study courses has to be done according to standardised criteria laid down in the Rules for accreditation of the Austrian *Fachhochschul* Council (FHS, 2001). These studies usually aim at forecasting the labour-market relevance of the proposed new study course by checking demand for its graduates with potential employers.

1.1.4. Forecasting demand for university studies

Although there are also legal regulations recommending labour-market forecasting before implementing new courses of university study, jurisdiction and methodological regulations are far less rigorous than for *Fachhochschul* study courses. Between 1997 and 2000, the Federal Ministry of Science and Technology commissioned several labour-market surveys for new university studies; forecasting demand for future graduates was mainly done by comparing

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([74]) Among those are also regular surveys like the Micro-prognosis and Lehrlings- und FacharbeiterInnenprognose.

([75]) *Fachhochschule* is a university of applied science.

available data on the labour market (graduation figures of individual study courses, unemployment data of the AMS) and interviewing selected labour-market experts.

1.2. Evaluating the current situation

Largest deficit of the current situation is the absence of regular studies focusing on changes in professional fields and the national labour market at the level of individual occupations and skills and competences. Although the micro-prognosis and the prognosis for apprentices and skilled workers might live up to usual standards for anticipation of skill needs research, neither of them really make any predictions on the level of individual occupations or skills, and both only deal with selected parts of the labour market. This lack of regularity and continuity in Austria's attempts at skill needs anticipation in general might be due to labour-market politics which have recently become more short-sighted, with interest lost in prolonged and continuous research. Many clients and contractors are active in the area or in ad hoc studies, but their output varies considerably in its analytical and descriptive quality. Beside the sometimes problematic scientific quality of these studies (Hörtnagl et al., 1999) these attempts also suffer from a lack of methodological diversity.

Macroeconomic forecasts as well as quantitative and qualitative enterprise surveys are most frequently undertaken, but, for example, analyses of job advertisements were not carried out until recently (see below). Without going into detail, the low degree of cross-linkage and systematisation between individual forecasting activities and their outcomes is particularly striking. This might partly be due to the many different taxonomies in use (several 'home made' for ad hoc purposes), which render comparisons impossible; there might also be a certain disregard for the work of other members of the scientific community. Also lacking is reference to national and international studies. The minimal cross-linkage might be the reason for the lack of methodological diversity and general opacity of the whole skills forecasting scene in Austria.

The studies have a limited horizon for planning and action, especially on design and development of vocational education and training. Concrete, useful and transferable recommendations for action are rare. There is also a discrepancy of interests between prospective contractors – researchers focusing on analysis – and clients – political decision-makers interested in recommendations for action. Further, studies so far were mainly addressed at a small circle of experts; others were excluded by the manner of publication and type of presentation. Finally, there is a lack of useful data in Austria. There are no statistical data on continuous vocational training, the national framework of qualifications is unsatisfactory and therefore the whole area of informally acquired qualifications (and thereby the real state of qualification of Austria's labour force) remains in the dark.

1.3. Recent approaches in Austria

Recent approaches to international research trends (Tessaring, 2003) counteract the above-mentioned deficits. Take the example of job advertisements analysis. It shows how a new research topic/method can widen the spectrum of national skills forecasting. New entities of analysis can be detected within regional skill demand surveys. The AMS skills research portal proved the trend towards networking. The AMS skills barometer as well as the link between a

vocational aptitude test and a regional skill needs survey exemplifies a trend towards presenting research outcomes to a larger user group than experts and political decision-makers alone.

1.3.1. New research topics/methods – job advertisements analysis

Until 2000, job advertisements analysis was not used to detect skill demand in Austria. Although the AMS has commissioned skills advertisements analyses for quite some time, these studies – only on occupational fields – were mainly used to compare manpower demand recorded by the AMS with that advertised in the press. Skills and competences demanded in these job advertisements were not analysed. Recently studies focused on this qualitative information (e.g. Paier and Beidernikl, 2002; MMO, 2002; Informationscouts, 2002). Although these studies are not able to forecast skill needs of the future they are still remarkable due to their extremely high level of detail and their up-to-date data (quarterly updates), thus recommending them as sources for skills trends especially relevant for those who have to react quickly to changes in demand, for example institutions involved in vocational training.

1.3.2. New entities of research – regional skill needs analysis

Taking labour-market intervention in the form of vocational counselling for enterprises as a starting point *OeSB Unternehmensberatung* and its spin off *Prospect* developed a mix of methods (ÖSB-Prospect, 2001), aiming at providing relevant information on regional labour-market developments to decision-makers. Usually regional (a district or a regional combination of districts) employment and labour-market developments within certain economic sectors (mostly those central to the regional labour market) are analysed and skill needs are identified through expert interviews. Via telephone interviews with representatives of selected enterprises, manpower demand and particular skill needs are discussed; current job openings and foreseeable replacements are considered as well. This special mix of methods allows for designing skills profiles of future employees in selected economic sectors thus also indicating possible training needs. Unfortunately, this method does not allow for a quantitative estimation of manpower and training needs at national level.

1.3.3. Networking – AMS research network ([76])

The success of the German FreQueNz shows, that linking individual activities and institutions in early identification of skill needs significantly increases its value. In 2001 Austria followed this example – again initiated by AMS – and started to interlink private and public research institutions by organising a yearly conference (*Qualifikationsbedarf der Zukunft*) ([77]) and providing a communication tool, the AMS research network. This web-based platform lists all relevant institutions in labour-market research and early skills identification in Austria, announces current events and provides an overview of recent research results by listing national and international publications (most available for download).

([76]) Available from Internet: http://www.ams-forschungsnetzwerk.at/ [cited 18.5.2006].

([77]) *Qualifikationsbedarf der Zukunft I* took place on 28 May 2002 and is documented under http://bis.ams.or.at/ forschungsnetzwerk/dokumentationQBZ.pdf [cited 27.4.2006]. Information to the follow up event of 18 October 2002 is available from Internet: http://www.ibw.at/html/projekte/proj_nat/ams/aktuell_fs.htm [cited 27.4.2006].

It is its innovative presentation rather than the mix of research topics or forecasting methods that is remarkable about the AMS skills barometer (^{78}). Since it represents Austria's most ambitious and innovative initiative in early identification of skill needs, let us look at it in more detail.

2. The AMS skills barometer as an example of innovative instruments in Austria's skills identification research

In 2002 the AMS entrusted 3s and ibw (^{79}) with the development of a system for continuous and comprehensive observation of developments in skill demands at the level of individual occupations (micro level). Although there was a need for a tool able to inform diverse user groups in a concise, reliable and easy to understand manner about current labour-market needs, such a system did not yet exist in Austria. The following questions should be answered by the system:

1) how many vacancies are there for certain vocations, vocational fields or sectors?

2) are there regional differences?

3) how do experts rate labour-market trends for certain vocations, vocational fields or sectors?

4) is there particularly strong demand for certain skills and competences in some vocational fields?

5) which trend developments in skills and competences are forecast by experts?

In February 2003, the AMS skills barometer went online, and has been maintained, developed and regularly evaluated ever since. We now want to describe this information system by discussing its envisaged user groups, its structure, current developments, some of its major problems as well as the results of the two evaluations undertaken so far.

2.1. Aims and envisaged user groups

The AMS skills barometer aims to inform the broad public via Internet about current and future qualification trends in a comprehensive and structured manner. From the beginning it was intended to use and compile available data – rather than construe a new instrument of observation. The AMS skills barometer represents an instrument of presentation rather than of analysis.

The following user groups should benefit from this innovative information source on labour-market trends:

(a) political decision-makers;

(b) people active in educational and vocational counselling, labour-market counsellors;

(c) journalists;

(d) decision-makers in education;

(^{78}) Available from Internet: http://www.ams.at/neu/1216_458.htm [cited 27.4.2006].

(^{79}) For details on 3s Unternehmensberatung and ibw – Institute for Research on Qualification and Training of the Austrian Economy refer to their website: http://www.3s.co.at and http://www.ibw.at [cited 27.4.2006].

(e) decision-makers at enterprise level;

(f) employees, job seekers, potential customers of vocational education and training facilities;

(g) AMS staff at all organisational levels.

2.2. Structure of the AMS skills barometer

The path laid out by the system's structure always leads from the general to the more specific, thus detailing information hierarchically. At the highest level, to be viewed when entering the system (Figure 1) a review of last two years' job openings is given (data provided by AMS and MMO's quantitative job advertisements analysis) ([80]). This information is available for the whole of Austria as well as for its nine federal provinces.

Labour-market trends and qualification needs are described in text as well as in tables providing the latest figures on job openings at the level of vocational fields and individual vocations.

In addition to quantitative data on job openings, labour-market experts describe the present situation as well as trends in text (not depicted here) and with the help of symbols (arrows and bullets, see Figure 2). Their assessment is based on a wealth of diverse sources (see below for details); 24 vocational sectors, 94 vocational fields, as well as 600 individual vocations and more than 200 skills and competences (the latter two described in tables only) are dealt with. Additional information on skills and competences – for example, definitions and more than 4 500 narrower terms – and information sources can be read back on demand.
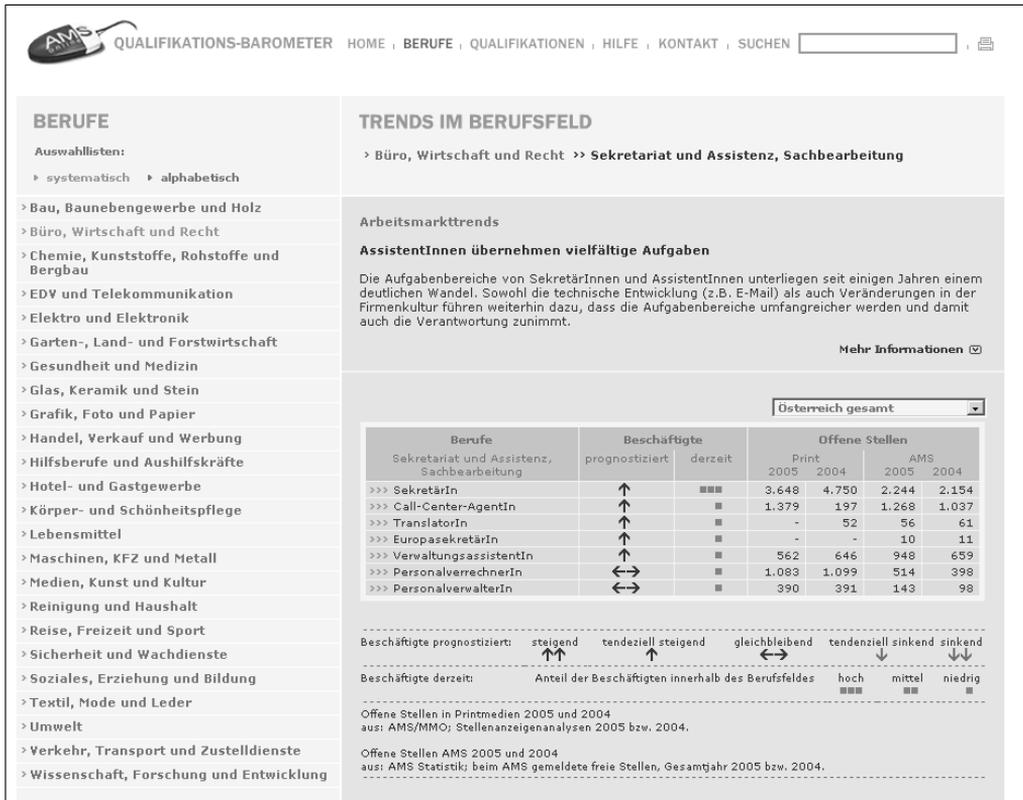
Figure 1: Start page: available job positions by vocational sector
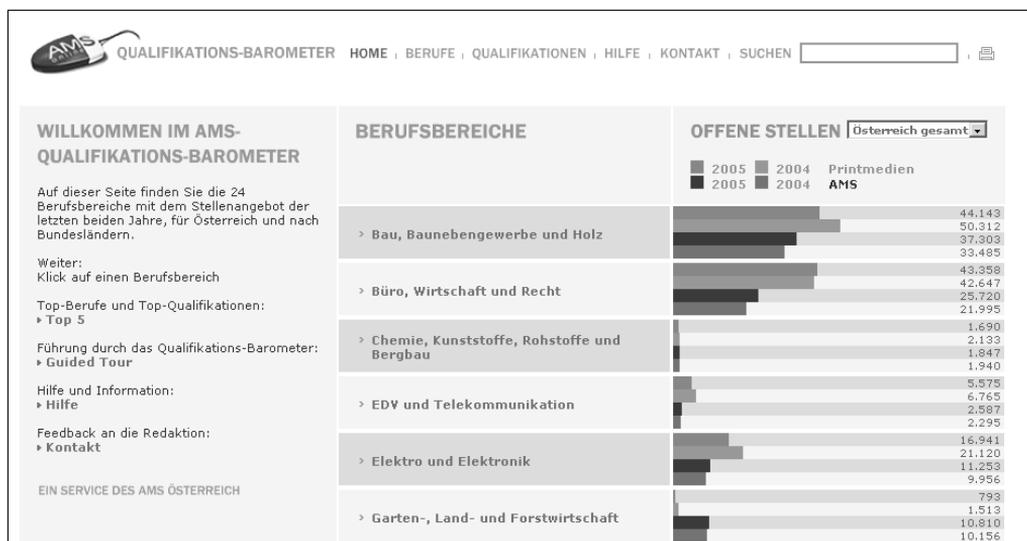
Source: AMS Österreich.

([80]) For details on MMO – Media & Market Observer refer to http://www.mmo.at [cited 27.4.2006].

Figure 2: Labour market trends and job openings for every vocational sector and field

2.3.   Information sources

The content of the AMS skills barometer rests on a mix of diverse information sources, which were evaluated, selected and interlinked in a structured manner: official statistical data, surveys and forecasts on skill needs and labour-market trends in Austria (regional as well as national); job advertisement analyses commissioned by AMS; expert interviews (human resource managers of leading enterprises, personnel advisors, managers of vocational education and training institutions, representatives of professional associations), specialised books, articles from relevant journals, etc.

To be selected as a source for the AMS skills barometer studies have to be relevant (focused on labour market and skills trends within Austria as a whole or its regions), methodologically valid and up-to-date (or at least contain information that is still valid).

2.4.   Methodological problems and strategies to solve them

2.4.1.   Information sources

One of the main problems for compiling the AMS skills barometer is integration of diverse data sources, especially resulting deficits in consistency between individual research statements.

Quality and focus of sources vary considerably, thus rendering final conclusions difficult. The different taxonomies in use are a particular challenge. For integrating official statistics and job advertisement analysis, and structuring the online information sources of the AMS, a taxonomy for vocations (AMS-*Berufsgruppenstruktur*) as well as for skills and competences (AMS-*Qualifikationsklassifikation*) has been developed in preceding projects. The latter has been made available as a comprehensive and up-to-date structuring and information device on vocational requirements and can be used outside the context of the AMS skills barometer as well.

The method used in job advertisement analyses (their usefulness has been discussed above) has major deficits: job advertisements usually mention only a small spectrum of technical skills necessary for a particular job opening (mainly surplus or trendy ones). New skills can only be identified if job advertisement analysis is repeated over a longer period using the same method and taxonomy. Presently the AMS skills barometer is not able to make use of these long-term surveys of job openings. Therefore, it was necessary to put more emphasis on other information sources – namely studies on skill needs and labour-market trends and expert interviews.

Available studies only analyse some vocational sectors (e.g. ICT and business economy) and fields, often only providing general information on individual vocations and skills and competences – too general information for an instrument dedicated to describing labour-market trends at micro level.

There is also a considerable delay between realising the need for research (a change in skill needs) and availability of results. There are also numerous and diverse methodological problems in many skill forecasting studies, for example their lack of scientific rigour and their deficits in drawing conclusions for planning and action.

2.4.2. *Selecting and interpreting information sources*

Another methodological challenge arises when (and if so, in what manner?) assessing the individual estimations given in different information sources. How to deal with conflicting statements? Is it a privilege for the editors of the AMS skills barometer to decide which research results are to be taken seriously and which are not? How to reach necessary conclusions to form a unified picture of skill trends? Should it be left to the user of the AMS skills barometer to decide on conflicting trend statements? The broad range of envisaged user groups appears unwilling to deal with conflicting information. Therefore, we decided to evaluate and condense the information available and present it in a uniform and easy to understand manner – hoping to have simplified a complicated matter without being simplistic.

2.4.3. *Heterogeneous user groups*

The AMS skills barometer is a web-based information tool accessible to a broad range of users. Most probably do not have any previous experience of socioeconomic research or taxonomies. Providing them with technical information that is at the same time comprehensive, concise and easy to understand is a challenge. Have we met that challenge?

2.5. **User evaluation**

In a evaluation undertaken in 2004 about 200 decision-makers for labour market, education and qualifications (such as representatives from social partner organisations, ministries,

vocational counsellors and researchers) were interviewed by telephone and asked to use the AMS skills barometer. More than half had not used the AMS skills barometer before.

Those having used it before, used it once or twice per month at most. When asked if they would use it in the future, their answers were encouraging: more than half plan to use the instrument once or twice per month and almost none cannot imagine not using it at all in the future (Figure 3). When asked 'will you further recommend the AMS skills barometer (e.g. to colleagues, clients, etc.)', 98 % declared they will recommend the instrument to others.

Figure 3: Evaluation of the AMS skills barometer 2004: expected future use
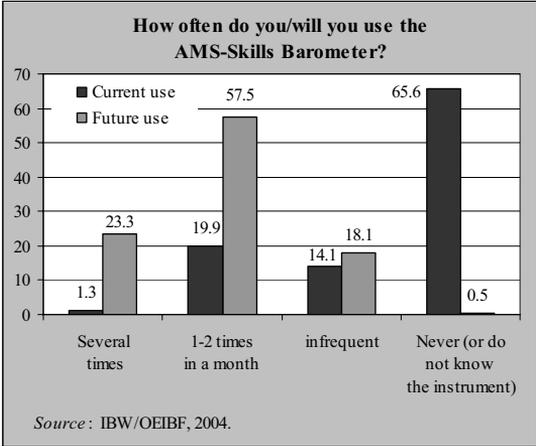
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Transferring skill identification results to policy and practice: systemic solutions.
Summary and conclusions

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> *How to implement research results in policy and practice?*
> *Is it embedded in the system?*
> *How is research linked to counselling and guidance?*

These were the main questions asked at the beginning of the workshop which discussed possible systemic solutions to transfer skill identification results to policy and practice. The workshop drew on experiences of projects and initiatives carried out in France, Germany and Austria.

Christine Guégnard presented the procedure of skill identification transfer in French regions asking whether the efficient transfer of research results to policy and practice at regional level is a dream or reality.

The reality and history of transfer of skill identification results to policy and practice developed from a national forecast in the 1970s to focus on regional needs to date. After national forecasts were discarded at the end of the 1970s, the process of skill identification was decentralised to regional authorities. Drawing on the example of cooks in France, there is a problem with the mix of data and information from national and regional levels. The exemplary process of transfer to policy and practice can be distinguished in four phases: first, it was a regional council question. The second was OREF's analysis, which showed that the problem was not to train enough cooks but to keep them in the sector, and that there is a local need for cooks. The third stage, the FAFIH analysis came to contradictory conclusions (more people are qualified than firms need). So, fourthly the regional council had to decide which conclusions to follow (it decided not to use the OREF analysis but to follow the FAFIH proposals).

This process of transfer to policy and practice is quite complex but it, nevertheless, confronts the relevant actors and decision-makers with results of skill needs identification and serves as an instrument to improve dialogue, consensus and diagnosis. The problem is that various logics are followed (administrative, territorial, national, sectoral) and the stronger the combination of logics, the less expertise is considered. Thus, it is a 'dream' to have a profound influence on decision-makers' strategies.

Helmut Kuwan presented some observations and conclusions based on Germany's research programme on early identification of skill and qualification needs.

Several questions were discussed: To whom and how are the results transferred? What is the impact of the transfer? And what are the conclusions drawn?

The projects of the German research programme on early identification of skill needs have different target groups in different fields of research. A major problem is key players and decision-makers change from field to field. The main approach is to address the 'process-owners' of the regulation system/processes but it is not possible to address certain levels in some fields. The success of transfer basically depends on the open-mindedness of actors involved. As such, there is no systematic approach.

This leads to the following conclusions and recommendations: systematic identification of topics of research is necessary. New frameworks or an organised structure for dialogue between research, policy and practice are needed.

As the discussion showed the 'successful failure' of pilot actions appears to be widely spread. Experiences of pilot actions can often be put into practice at local or restricted levels but they fail to be implemented at other levels. This implies a new role for scientists: to leave the 'inner circle' and think in a multi-client setting for transferring research results. Should research focus on such kinds of implementation processes and should it turn towards 'implementation research'.

Jörg Markowitsch and Reinhold Gaubitsch presented new developments in early identification of skill needs in Austria: the AMS skill barometer. A review of the status quo of early identification of skill needs in Austria showed data are insufficient and there are only a few regular surveys and no regular long-term forecasts. Ad hoc surveys are of varying quality and there is neither networking nor systematisation, thus poor relevance for planning. Nevertheless, early identification in Austria is changing: there are new approaches such as analysing job offers, new entities of research (local skill needs analysis) and new target groups. What seems to be becoming more important in Austria in trends of early identification are continuous monitoring systems, instead of ad hoc surveys; the link to quality assurance systems of education providers; skills (as objects of analysis), in addition to forecasting occupations; and, for counselling and guidance, 'editing' information for individuals (e.g. job-seekers), in addition to experts and policy-makers. In this respect the AMS skill barometer is a comprehensive online information system for developments of labour-market requirements. It contains detailed descriptions of trends in employment and labour-market requirements according to vocational sectors and fields (including regional characteristics, trend ratings, vacancies and trends for skills and competences).

Discussion in the workshop showed there are various approaches to ensure implementation of research results. This, unfortunately, does not help answer questions on its embeddedness in systems in general. Debate on the link of results of early identification and the counselling and guidance system, i.e. 'editing' information for individuals in addition to experts and policy-makers, has just started.

PART VI

A European system of
early identification of skill needs?

Christopher Hilbert
**Systems of identification of skill needs
in OECD countries**

Koji Miyamoto
**Policy objectives and added value of
an international assessment of adult competences**

Olga Strietska-Ilina
**Review of systems of early identification of skill needs
in the EU based on Cedefop/ETF information**

Systems of identification of skill needs in OECD countries

Christoph Hilbert
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Demographic changes, skill and labour shortages are expected to rise in the future, making early identification of skill and qualification needs ever more necessary. Analyses should, however, provide reasonably reliable and detailed information so the right decisions can be taken by various actors in education and training. A complex and integrated system of early identification of skill needs is necessary. This contribution draws on the experience of several OECD countries, namely Canada, Germany, Switzerland and Scandinavian countries. Positive features of each of the systems led to certain conclusions and recommendations for an 'ideal' system of early identification, its internal integrity and interaction at different levels, combination of methods and approaches, and adding value of information from different sources. Finally, the contribution touches on the need to establish a European system of early identification of skill needs.

1.   Introduction ([81])

There is widespread consensus on the key role of human capital to achieve stable employment patterns. The question is which qualifications to provide. Calling for a higher qualification level is one option to answer the needs of the information society, but this strategy is not only expensive and sometimes inefficient, but also difficult to implement. Especially considering the future supply of labour has become one of the major challenges of our time and there are already fewer people entering working life every year than there are exits. Add to this, ongoing restructuring of labour markets and significant changes in occupational structures and skill requirements.

The process of economic transformation coinciding with a radical demographic shift raises difficult questions about how Europe can remain competitive and achieve higher employment and economic growth in the future. The so-called 'demographic time bomb' has induced that by 2030 there will be 110 million people over the age of 65 in the EU-25, up from 71 million in 2000. Although opportunities in demand for new products and services should not be neglected, the implications for employment, productivity and growth will be serious. As the old age population grows, the working age population will shrink (Figure 1). By 2030 it will stand at 280 million compared to 303 million today. This means that even if the EU meets its target of having an employment rate of 70 % by 2010 – on which there is already doubt – the fall in the working age population over the subsequent 20 years will result in a sharp overall decline in the volume of employment. The EU-25 would lose an average of one million

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([81]) To clarify some terminology: 'anticipation' and 'identification' are used more or less as synonyms. Apart from disciplinary discussions the author's opinion is they express more or less the same target: improving knowledge of possible future developments with different scientific tools.

workers a year. Under such conditions it is perhaps more important and challenging than ever to ensure efficient matching between supply and demand for certain qualifications.

Figure 1: Total population in employment in EU-25 (in million) assuming an employment rate of 70 % in 2010 and for the following period until 2030

Source: Employment Task Force, 2003.
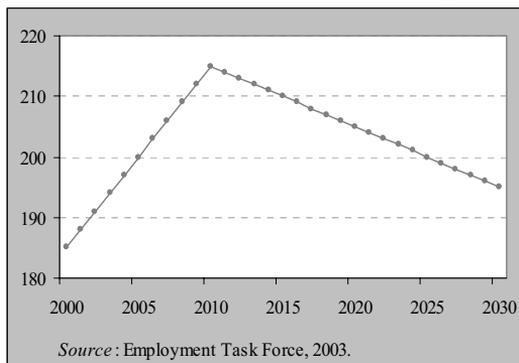
Another important indication of the need for analysing skill requirements is the risk of market failure. Sources of market failure in skills and qualifications mainly stem from scarcity of reliable information of present use of skills by firms and current employees as well as from lack of information on existing skills of current and potential employees such as new labour-market entrants. Besides market failure, we have to guard against the possibility of policy failure. This could consist of 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 sensitively to the assumption of macroeconomic growth. Proper anticipation of how the skill content of occupations is evolving and the type of new skills required raises many challenges for policy-makers, as failure to plan adequately could have potentially serious consequences for economic and social development.

Assumptions are always weak and therefore, forecasts, understood as more or less likely developments, can assist strategic decision-making in educational planning or lifelong learning processes, although they are not suitable for providing precise estimates on needed capacities, since there are many intervening factors which are not accounted for in these models ([82]).

2. Identification of skill needs: some international experiences

2.1. The facts

In recent years, several EU Member States have increased attention on the coexistence of high unemployment and skill shortages. Deeper insight into labour market structures and knowledge

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([82]) For more detailed discussion of this issue see Hilbert and Schömann (2005).

of future challenges have increased public attention on such imbalances and governments, as well as social partners and other interest groups, are searching for solutions to reduce labour-market mismatches. Researchers, almost unanimously, support the hypothesis of a highly qualified labour force for macroeconomic growth and high individual earnings. However, little detailed knowledge is available on the necessary specifications of occupational profiles needed on the labour market. Specific required qualifications or specific professions in short supply as well as competences need to match demand on the labour market. Such competences will have to follow demand for specific products and services.

As a result efforts to identify skill needs differ greatly between countries according to their industrial heritage and shares and kinds of services of the whole economy. While some countries such as Canada and the US have a long tradition of extensive quantitative analyses, most EU Member States show a more divergent and fragmented landscape. Previously, most countries and regions invested in different programmes – with different outcomes in quality and continuity. As most labour-market mismatch is more a regional than a national phenomenon, any work at EU level has to be questioned. In the following section three examples of skill needs analyses are given.

2.2.   Germany

In Germany, for example, the FreQueNz network ([83]), an initiative financed by the German Federal Ministry of Education and Research (BMBF), provides results for different user groups. FreQueNz is a research network in which various institutes and institutions contribute to the early identification of qualification needs. The FreQueNz network also involves development, implementation and operation of an electronic information and communication platform. The projects of the partner institutes and institutions participating in the network cover a large variety of research fields ranging from direct observation of changes at the workplace to an international comparison of early identification activities in competitor countries. An important aspect is the resulting plurality of research concepts and methods characterising the research network.

Within the initiative, the WZB/IUB-project deals with analyses and forecasts on qualification needs and implementation into vocational and continuing training systems. The perspective is international-comparative. Reducing skill shortages is a vital part of EU policy since the Lisbon summit's adoption of the target. Early identification and anticipation of mismatches and skill needs, therefore, is central for the EU and the OECD (Wilson, 2001; Neugart and Schömann, 2002). Hilbert and Mytzek (2002) show how regional analyses can contribute to broader efficiency in education and labour-market policy and improve labour-market matching. A proposal for systematic analyses will be developed, considering cost efficiency analyses. Combining quantitative forecasts and additional qualitative analyses are the basis for target-oriented, integrated regional labour, education and structural policy building on regional networks. Enrolment rates at advanced technical colleges and universities show cyclical variations, which cannot only be explained by productivity shocks (so-called 'cobweb', (Neugart, 2000)). Access to information on future income possibilities is costly; therefore

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([83])   Available from Internet: http://www.frequenz.net [cited 3.5.2006].

actors use forecasting methods extrapolating information from the past. The political alternative is providing information on labour-market developments as a precondition for access to advanced technical colleges, universities and other education providers.

2.3.   Scandinavian countries: no integrated system but proper information at different levels

In Scandinavian countries, there are various actors, applying a wide array of instruments, engaged in identifying and understanding potential mismatches. Main instruments employed ensure availability of regularly updated information on current and short-term qualification needs and bottlenecks on the labour market. This is an area where, in all the three countries, public employment services (PES) stand out as the central actor. The main instruments are regular surveys with a comprehensive selection of representative firms, and extensive ongoing contacts with other labour-market 'stakeholders'. Based on this information, PES in the individual countries provide regular reports on labour-market developments and short-term labour-market forecasts. The information spectrum in these reports is comprehensive, but expectations of future developments are in focus.

To sum up there are various actors engaged in forecasting labour-market developments in individual countries. The public employment services (PES) stand out as the main actors identifying short-term needs and the characteristics of current mismatches. PES efforts are primarily carried out at regional and/or local levels. The information obtained is essential to adjust the focus of labour-market training, which has the primary objective of supporting employment offices in their efforts to smooth matching processes on the labour market. In all three countries, models have also been developed to project medium and long-term supply of labour by education groups and demand for labour by branch. A common feature of these models is they offer thought-provoking mismatch scenarios rather than genuine forecasts of the most probable labour-market outcome. To some extent the projections are employed to regulate education and training dimensions, primarily within higher education. However, the central political strategy in Scandinavian countries is to provide all individuals with an adequate education offer. Thus, the medium- and long-term projections appear primarily useful for individuals deciding on their career paths, and to highlight situations where there is an obvious conflict between individuals' demands for education and training and the labour-market needs for certain types of skills. Other central aspects of the Scandinavian system include decentralisation, management by objectives, and representation of the social partners in important advisory as well as decision-making bodies at national and regional levels (for a more detailed description of Scandinavia see Lindskog, 2004).

2.4.   Switzerland: regional definition by economic – not - political parameters

Switzerland traditionally has a specific position in Europe. For example, even after the end of the Cold War, it remained politically neutral. Economically, its development after World War II also differed substantially from other European and nearly all other OECD countries. For example, economic growth was low and characterised by insignificant cycles and unemployment was a marginal problem of around 1% during the whole period. Independent of this stable pattern, questions on immigration policy have – compared, for example, to Canada – always

been of relevance to Switzerland. Since the beginning of the 1990s the stable employment pattern changed rapidly due to different influences (84).

At regional level, Switzerland – like many other countries – is characterised by huge disparities (OECD, 2000). This is less surprising under the cultural and economic heterogeneity of the country and the relatively small geographical expansion. Due to these growing interregional differences local and regional activities become more important but well-coordinated regional strategies are very much needed. The aim of region-oriented, intercantonal cooperation is, therefore, to answer central questions by evaluating systematic information on both the labour force and companies.

At present there are two initiatives at regional level in Switzerland. Since 1997 there is the ORTE initiative in the western, French and Italian speaking parts, where results and studies are already available (85). The AMOSA initiative (86) of east Switzerland is still quite young, but the beginning of both initiatives is comparable. The starting point was the realisation that personnel advisors have good knowledge of their specific market, but this knowledge is fragmented and, therefore, not useful for clear predictions of future requirements of qualifications. The second step of the analysis was evaluation of existing statistics and studies. It showed existing results supply information on medium-term developments and general statements on the growth potential of specific industries in individual regions. These results are not sufficient to make clear, practice-oriented predictions on future skill needs. Therefore, in a third step in-depth branch analyses were carried out. An example is a study on skill needs in the financial sector in the region of Zurich. This analysis consists of four parts: first, an employer survey; second, a vacancy analysis; third, analysis of the qualification profile of the unemployed; and fourth, the project is supplemented by a study of the experiences of employment consultants of public employment services.

To sum up, the two Swiss approaches are a promising step towards more transparency in regional labour markets. The four-step approach which considers different quantitative and qualitative resources can especially help focus future analyses on those branches which are most important for specific regions. Considering the lack of an integrated information system (87), this is a good example of pragmatic cooperation between political actors and decision-makers at regional levels.

2.5. Canada: observing regional labour markets in line with market requirements

For much of Canada, responsibility for administering the skill needs system has recently been devolved to the provinces by the federal government. Regional perspectives are being employed to a greater extent. The current system was especially driven by pressure from Quebec, which had been interested in more active labour-market policies for many years. This system is based on two pillars: full responsibility for development and implementation of

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(84) Puhani (2003) gives a good review of possible causes.

(85) Available from Internet: http://www.emploi.vd.ch [cited 3.5.2006].

(86) Available from Internet: http://www.amosa.net/ [cited 3.5.2006].

(87) The studies give very good information on potential future development, but no information is available on general trends as there is no macroanalysis or general branch- or occupation-oriented information published.

active measures is in the hands of the provinces and strong interaction between provinces, regions and the national government ([88]).

While decisions are the responsibility of regions, budgetary responsibility for the unemployment benefit fund remains in the hands of the national government. The objective is, first, to make regional labour-market information more comprehensive and, second, to integrate the information into the national system to ensure interregional transparency and, therefore, support potential regional mobility.

Special emphasis in the Canadian skill information system – national and regional – is on developing and extending career-oriented information. At national level, central access is through job futures/*emploi-avenir* ([89]). Job futures is a user-friendly information platform with rich information on different labour market, education and further training issues. Apart from profiles of more than 200 occupations, many Internet links to more detailed information are provided. Integration of regional information, for example, is provided by occupational groups. To sum up, the Canadian system is well developed especially in transparency. The usefulness of the regional information by reducing mismatch, supporting local networks or stakeholders has not yet been analysed.

3. Theory of an 'ideal' skill needs identification system

In the preceding chapter, three countries were highlighted to support the arguments for a general framework of skill anticipation systems ([90]). Taking the main characteristics of the systems described, we tried to create a synopsis of an 'ideal' anticipation system. There is no doubt it is difficult to anticipate skill needs on today's dynamic labour market. No method offers forecasts that provide education planners with precise information on the appropriate number of persons with the right mixture of skills.

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	Reduce risk of human capital investment through more transparency
Efficient allocation of labour-market programmes	Reduction of disadvantage of SME versus global firms	Reduce asymmetric information about returns on education
Immigration policies	Prevention of supply shortages	Reduce risk of future unemployment

Source: the author.

Bearing market orientation in mind we can differentiate three main target groups. These three groups and their main interest in information are depicted in Table 1. The first target group demanding information on labour market and qualification needs is the government, i.e.

([88])   For this aspect see, for example, OECD (1999) and Bakvis (2000).

([89])   Available from Internet: http://www.jobfutures.ca/ [cited 3.5.2006].

([90])   This is only an extract from our project work to underpin the main arguments. For more detailed work see Hilbert et al. (2000); Hilbert and Mytzek (2002); Neugart and Schömann (2002); Hilbert (2004).

politicians and decision-makers in ministries and public authorities involved in education, training and labour-market policy planning. Their main aim is the smooth functioning of the labour market from the macro perspective and for this, the character of their decisions is more strategic. Consequently, they do not need detailed, highly disaggregated information about short-term developments.

For basic information, they need a good and reliable picture of the whole labour market and expected future developments of qualification needs within specific activities and professions. In addition to this broad view, they also need specific and detailed information in particular sectors and regions, for example for planning education capacity or new curricula. This implies their main interest is at a general, mid-term level. The mid- to long-term perspective is also relevant.

The second group is the demand side of the labour market, companies and enterprises, and, defined as service provider for demand and supply sides, employment agencies, whether they are public or private institutions. As the aim of this group is much more at operative level, a short-term perspective, developments in specific branches and shortages or excess in activities and professions, and often in regional labour markets, are the criteria for useful information for this group. For large firms operating internationally, information can be important for allocating their research and development activities, personnel strategies and location of production plants. Often, these firms also have well developed 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 skill needs. Consequently, their decisions are less systematic. So, with supply of labour-market information as a public good, asymmetric information due to firm size can be reduced. Upward wage pressure triggered by supply shortage can also be reduced.

Third are individuals. They have an interest in transparent information to guide their educational, occupational and training choices. In lifelong learning, not only are those willing to start an apprenticeship or study, and their parents and teachers interested in more transparency of markets for skills, but also everyone who wants to take part in further education and training.

Therefore, an approach considering different methodological and network aspects is desirable. In addition to national macro studies on labour market and qualification development, sectoral and regional studies should be the second pillar of an integrated system. Especially at regional level, lack of transparency is often the case. For Germany for example, the FreQueNz network is a promising approach which integrates different research institutions and social partners at national level. But regionally, cooperation needs to be improved. One reason for this is federalism and, therefore, the distribution of competences at different national and subnational levels in employment, education and labour-market policies. The Swiss approach shows a possible way of regional research – independent of 'political' frontiers in a federal State. Last but not least, the Canadian example is a good one for an approach to integrate specific regional activities in a national system.

So how should an 'ideal' system, based on the today's knowledge of desirable information on the labour market, be designed? Figure 2 shows an 'ideal' framework for skill need analyses in a national framework. Its central characteristic is combining top-down and bottom-up approaches in one publicly accessible information system. Top-down approaches are mostly quantitative 'classical' macroeconomic analyses. Originally they were mostly at national level. But, due to better technology and methodology, as well as better data availability, these

approaches are also feasible at less aggregated, regional levels as seen in the Netherlands and the UK. These approaches are also not quantitative in principle. Qualitative methods such as Delphi analyses also belong to this category. In common, there are more standardised methods with a mid- to long -term perspective. The advantage of these analyses is they can be run relatively efficiently over several years and therefore, controlling validity is possible ([91]) by following trends and carrying out *ex post* analyses.

Bottom-up approaches are characterised by methodological diversity. Quantitatively, analyses of microdata, both labour supply through household panels as well as labour demand analyses through company panels, are possible. But the main analysis from the 'bottom' is qualitative. This approach is more or less independent of statistical categories, so trend analyses of skills and knowledge independent of specific branches and/or occupations are possible. This provides deeper knowledge of potential future developments within specific regional or structural labour markets.

At the heart of the scheme is an easily accessible practical information system which avoids redundancies in research. This tool should be interactive and Internet-based. This alternative allows easy access to all potential user groups. Further, by making the information publicly accessible, not only the research community benefits from more transparency. Through more transparency, and therefore better information from all market participants, potential mismatch (by e.g. promoting interregional mobility) or cobweb-cycles in specific professions can be avoided. Examples of different approaches are the FreQueNz website in Germany, the Swiss alternative, preferably ORTE, and the COPS website in Canada.

To sum up, in the information society many arguments support the hypothesis that human capital is the key to job security and sustainable growth. Labour market transparency and skill developments are the basis for reducing risks of disadvantage and effective equality of opportunities. Free and non-restricted access to labour market and skill needs information, preferably by Internet, is desirable and consequently, information on future skill needs shares many characteristics of a public good. Its provision and financing will also rely to varying degrees on public bodies. While finding more skill needs analyses in nearly all European countries, and accepting this is important for international competitiveness, the question whether there is any need for a European level skill needs analysis still arises. There are two important arguments. First, from an academic viewpoint and based on our project experience, sharing knowledge on methods and results helps to improve the quality of information substantially. Second, from a more practical perspective, cross-country mobility is growing and therefore information on skill needs at European level is needed.

Because, in many ways, specific regions in different countries have better comparable structure and economic potential due to their economic and human capital, looking at and comparing these regions is often more useful for learning from one another than looking at diverging regions within one country. An international perspective has two advantages:

([91]) *Ex post* analyses to control the quality of analyses is a difficult issue in itself. This aspect will not be discussed here in detail.

learning from one another in a scientific perspective and benefit from experiences and learning from regions beyond national borders.

Figure 2: Framework for an ideal information system of skill needs in a federal State
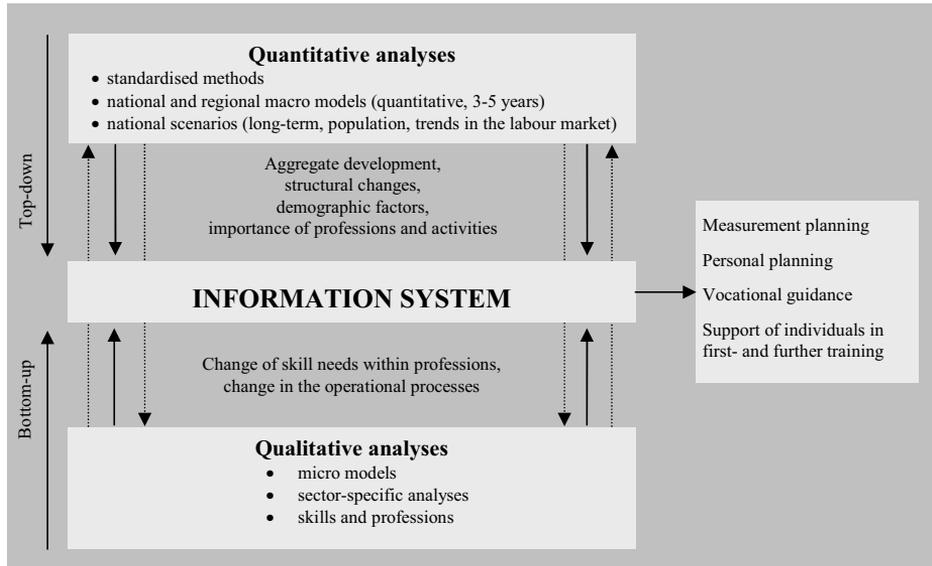
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Policy objectives and added value of an international assessment of adult competences

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This contribution describes policy objectives and value added by conducting an international assessment of adult competences. It provides an outline of the type of data that might be used, and how data could be used to shed light on some policy challenges that OECD member countries face. While countries may face many policy priorities, the focus of this contribution is only on three broad policy areas that could be of imminent interest ([92]).

1. Policy objectives of an international assessment of adult competences

1.1. Improving school-to-work transition and reducing youth unemployment

Achieving efficient transition to productive employment among young people is a priority for many OECD governments. Youth unemployment has increased substantially in recent years, reaching in 2003 an OECD average of 13.5 % among youth between the ages of 15 and 24 (OECD, 2004). Such high, and in some countries persistent, youth unemployment raises important questions about possible mismatches between the competences possessed by young people and the competences required by employers ([93]).

A new international assessment of adult competences could first identify the type of competences that countries may have to invest in for effective school-to-work transition. It could also provide new data and analyses on how, across countries and over time, transition outcomes ([94]) – for young people of different ages, genders and levels of educational

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([92]) This contribution draws on a document entitled *The relevance of PIAAC to education and labour market policies* (OECD, 2005). Programme for the international assessment of adult competences (PIAAC) is an OECD initiative to develop a strategy for assessing adult competences. This programme started at the end of 2003 when the committees governing the OECD's work on education, employment, labour and social affairs considered it potentially possible to develop an international comparative assessment of adult competences. The committees decided to explore the development of a data strategy that would: identify and measure differences between individuals and countries in competences believed to underlie personal and societal success; assess the impact of these competences on social and economic outcomes for individuals and countries; gauge the performance of education and training systems in generating required competences; and help to clarify the policy levers that could contribute to improving competences. To this end, an international expert group was constituted, representing 27 countries, to assist in identifying a possible data strategy. The views expressed herein do not necessarily reflect those of OECD member countries.

([93]) For instance, policy-makers need to know whether skill mismatches are attributable to school systems that produce young adults without the level or type of necessary skills. Similarly, it is essential to know whether skill mismatches reflect deficient enterprise-level training aimed at developing specific skills in young adults who enter the labour market possessing only generic skills.

([94]) Transition outcomes include (a) transition probabilities to employment, (b) transition duration, and (c) a range of labour market outcomes such as job security and wages.

attainment – relate to a comprehensive array of education, labour market and other policy settings (⁹⁵). Moreover, a new assessment could distinguish policy and institutional settings that are conducive to competence development and those that are not. For instance, by comparing the impact of competence-related policies and other policies on transition outcomes, policy-makers could determine whether more emphasis should be placed on competence related policies, or on other labour market policies in improving school-to-work transition. The following describes how a new international assessment could enlighten policy choices:

(a) through direct testing of competences and using the job reporting approach (⁹⁶), an assessment could collect data on a range of competences possessed by young adults that have completed initial education within some specified period of the survey date (⁹⁷). In addition, using a retrospective questionnaire, an assessment could collect data on individual characteristics such as years of initial education, field of study and type of educational institutions attended. Finally, labour-market characteristics at the time when the transition took place could be captured through a standardised questionnaire addressed to relevant institutions (⁹⁸). By relating this information to transition outcomes, policy-makers would obtain a better understanding of the type of competences that might be developed to improve school-to-work transition;

(b) using a retrospective questionnaire, an assessment could, for each survey respondent, collect data on:

(i) individual characteristics;

(ii) the extent of work experience during education (e.g. whether students have combined study with part-time work);

(iii) participation in special youth programmes; and possibly

(iv) other competence-related policy and institutional settings.

This information could then be related to transition outcomes. Data on policy and institutional settings in each country or relevant subnational entity could be obtained using a standardised questionnaire on policies and available schemes/programmes on adult learning.

(d) using (i) until (iv) in the preceding paragraph, in addition to a range of policy and institutional settings that do not directly pertain to competences (e.g. those that aim to improve the functioning of the labour market, changing minimum wages, etc.) but are likely to have some impact on transition outcomes, an assessment would be able to

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(⁹⁵) These settings could range, i.e. from the existence and management modes of organised safety nets for early school leavers, to the level of development of the vocational education sector.

(⁹⁶) The job reporting approach is an indirect method for assessing competences that uses a survey to elicit information from individuals regarding the tasks performed in the workplace and the associated type, importance and intensity of skill use.

(⁹⁷) For example a new international assessment could survey young adults aged 18-25 that have recently completed initial education (which may include job training, preceding labour-market entry). If survey respondents have left initial education recently, it would be reasonable to assume that their competences at the time of survey do not differ significantly from those they possessed when they were about to make the transition.

(⁹⁸) Data on labour market and/or policy settings in each country or relevant subnational entity could be obtained using a standardised questionnaire, addressed to relevant institutions, with the responses reviewed by independent experts to ensure cross-country comparability.

compare the relative impact of competence-related policies and other policies on easing school-to-work transition.

More generally, and across several assessment cycles, a new assessment could examine how and why patterns of youth transition have changed over time. Continuing analysis of youth transition into a second assessment cycle would facilitate exploration of longer-term concerns, such as how key features of education systems affect the persistence of competences into the transition period and later life. A new assessment could also address longstanding limitations in the international comparative analysis of transition processes. For example, in many studies, distinctions between inactivity and unemployment among young people are uncertain. For instance, in the latter part of the 1990s, around half of the inactivity of young adult males in Sweden was associated with military service or foreign travel. This poses a particular problem when comparing different national analyses, as inactivity may be a choice rather than a result of some labour market or non-economic constraint. A new assessment could ensure that findings across countries were genuinely comparable by differentiating between types of inactivity through information obtained from a background questionnaire.

1.2.   Meeting the challenges of an ageing population in a lifelong learning perspective

Governments' interest in promoting lifelong learning stems from several concerns. These include evidence of rising employment and wages for skills and, in a related way, evidence that greater competences are needed to take advantage of new technologies and adapt to the challenges of globalisation. Many observers also hold that changes in workplace organisation have led to shifts in demand for different types of skills. It is often claimed that the new workplace requires workers with multiple skills, particularly general skills in such areas as problem solving and communication, as well as inter- and intrapersonal competences and ability to work autonomously.

At the same time, the rapid ageing of OECD populations raises critical skills-related concerns. For instance, while life expectancy is rising, falling birth rates mean that Europe's workforce will begin to contract from 2010 onwards. At current employment rates, the number of workers in the 15 countries that were members of the EU prior to 1 May 2004 could fall by 14 million over the next 25 years. Were this projected contraction to occur, the region's economic output could decline by around 7 %, short of a major increase in immigration ([99]). Growing fiscal burdens associated with rising payments for pensions and health care – and high levels of economic inactivity in an expanding cohort of older citizens – will require that workers remain economically productive later in life ([100]). Ensuring that older workers have the kind of competences needed for longer careers will require that governments possess an evidence base on both the competences of older workers and of the policy settings conducive to lifelong learning ([101]).

([99]) International Herald Tribune (2004).

([100]) The costs for society of economic inactivity among older adults can be significant. A recent report from the UK estimated that the relatively lower level of employment among older workers costs the UK economy between GBP 19 and GBP 31 billion a year in lost output and taxes and increased welfare payments (National Audit Office, 2004).

([101]) Lifelong learning encompasses learning from birth onwards. Here the term refers to adult learning after initial education.

A new assessment could help inform responses to such policy challenges by examining, for instance:

(a) patterns of competence acquisition and erosion through the lifecycle, and how these affect adults' labour market performance;

(b) how various adult learning programmes might better help develop the competences of older adults should they remain in the labour market longer;

(c) the role of attitudes, beliefs, and values in learning behaviour;

(d) how competences and qualifications among labour force entrants affect learning opportunities later on in life.

This information would be useful for policy-makers considering the role of initial education and adult learning policies in:

(e) increasing participation in adult learning especially among older people;

(f) promoting skill formation and minimising skill erosion.

The following describes how a new international assessment could develop these analyses.

For (a), in the preceding paragraph, an assessment would, using direct testing and the job reporting approach over multiple cycles, follow the changes in assessed competences across time ([102]). In addition, a retrospective questionnaire could be used to collect data on individual characteristics such as years of initial education and field of study. This information could then be related to labour market performance (e.g. employment status, job tenure and wage levels).

For (b), data from direct tests and the job reporting approach could be used to ascertain changes in assessed competences over time, contrasted with the types of adult learning programmes and courses that individuals had participated in (data on which could be captured by using a retrospective questionnaire).

For (c), a questionnaire would be used to extract data on individual attitudes, beliefs and values relevant to adult learning. This data could be contrasted with information on learning behaviour, which could be ascertained if the same questionnaire captures data on participation in adult learning, type of adult learning institutions attended, and the type of courses attended.

For (d), a direct test and the job reporting approach could be used to collect data on the level of competences among recent entrants to the labour market. This could be combined with use of a questionnaire to capture data on individual characteristics such as years of initial education, qualifications attained, etc. This information would be contrasted with learning opportunities later on in life, such as participation in enterprise-based training. The information on competences and qualifications would be extracted during the first assessment cycle, while the subsequent learning opportunities would be surveyed in later cycles.

For (e), a retrospective questionnaire would be used to examine individual characteristics (particularly among older adults) such as years of initial education, field of study, use of government supported schemes such as tax-deduction, subsidies, vouchers, etc. This information

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([102]) Ideally, from a purely analytical perspective, a new international survey would follow the same individual over time, generating panel data. A second best would be to construct synthetic panel data.

could then be related to data on a range of available adult learning incentive schemes, which could be obtained for each country using a standardised questionnaire.

For (f), an assessment could capture information on a range of adult learning programmes that minimise skills obsolescence. Through data from direct tests and the job reporting approach as well as a retrospective questionnaire – for the same individuals over time – it would be possible to associate policies with changes in competences.

1.3.   Improving labour-market prospects and socioeconomic chances of at-risk groups

'At-risk' adults are persons having a high propensity to experience unemployment or labour-market inactivity. Broader concepts of socioeconomic risk might also be used, relating for example to the likelihood of experiencing poverty, ill-health, crime, etc. Often, groups with a propensity to be unemployed or inactive include disadvantaged youth, long-term unemployed persons, single parents, the disabled and, in some countries, individuals from ethnic minorities.

Policies that cater to the needs of at-risk adults are important for at least three reasons. First, addressing the needs of the most vulnerable is an obvious social equity objective. Second, if market failures hinder the acquisition of competences, these failures are most likely to represent binding constraints for at-risk adults. Third, research suggests that the impacts on macroeconomic growth from improving competences among those with low levels of skill might be high. For instance, using data from the international adult literacy survey (IALS), Coulombe et al. (2004) found that even small increases in the middle of literacy skills distribution, where most workers are, would yield sizeable growth effects. Still more significant economic gains could be achieved by raising literacy among those with the lowest literacy skills.

A new international assessment could shed light on how, across countries and over time, changes in the competences of at-risk adults are related to policy and institutional settings ranging from the level of funding for education programmes targeted towards at-risk adults, to the availability of options for combining benefit income with income from work (which could affect incentives for work and thus acquisition of work-related competences). It is possible a new assessment could also bring about development of a new instrument(s) to assess the competences of adults with low levels of skills. New measurement technology in this area would have the potential to identify the elements of curriculum design most needed to improve the competences of low-skilled individuals in remedial forms of education. It might also improve early identification procedures aimed at those individuals in initial education likely to experience difficulties in acquiring essential competences. The following describes how a new assessment could shed light on the policies that would help improve labour-market prospects and socioeconomic status of at-risk groups:

(a)   a new assessment could use direct tests and the job reporting approach to estimate the share of the adult population in each country having the types and levels of competence most associated with high levels of risk. In addition, a questionnaire could be used to ascertain data necessary to profile the socioeconomic background of the at-risk adult population in each country. This information could allow policy-makers better to understand the magnitude of skill deficits among at-risk groups, and better to identify individuals that require special attention;

(b) a new assessment could identify combinations of policies that appear most effective in mitigating known risk factors – for example social class, parents' education, and educational attainment (particularly non-achievement of upper-secondary education). This could be done by associating a range of available policies (e.g. special schools for students with disabilities, integration programmes for immigrants, labour-market training programmes, active disability policy, and social security benefits) with participation in competence development activities. Information on available policies could be obtained for each country based on a standardised questionnaire;

(c) over several assessment cycles, the relative growth effects of public investments to upgrade competences among groups from different parts of competences distribution could be estimated. The level of public investment by group could be proxied by:

(i) data on overall expenditure devoted to programmes catering for each at-risk group;

(ii) the existence/intensity of various programmes for each at-risk group.

Data on both proxies could be obtained via a standardised questionnaire on policies and available schemes/programmes on adult learning. Data on these indicators could be related to changes in competences across time for each group.

2. What are the advantages of an international assessment and how can a new assessment improve earlier international assessments of skills?

There are several advantages of assessing adult competences internationally, rather than through national assessments alone. Principal among these are the following:

(a) assessing cross-country differences in the level and distribution of competences – and relating these to economic, social, policy, and contextual conditions – would permit policy-makers to assess the comparative strengths and weaknesses in their country's past and current achievements. Such data could help decision-makers to push forward necessary policy reforms aimed, for instance, at improving the level and distribution of competences;

(b) because cross-country variation in policies and institutional settings is greater than intracountry variation, an international assessment can in principle provide more policy-relevant data and analysis than a compilation of national assessments (if the latter were not strictly comparable) ([103]);

(c) synergies and economies of scale would be generated by international cooperation in developing and using new assessment instruments. For instance, all countries could draw on institutional capacities and expertise in other participating countries. Thus, a new assessment would be a cost-effective and viable option for assessing competences, especially for countries that do not have sufficient institutional capacity to conduct such a survey alone;

(d) many, if not all, OECD member countries adhere to national and multinational statements of intent on achieving economic performance targets relative to international norms. An

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([103]) For example, in considering policies to improve competences among immigrants in Canada, it would help to examine the outcomes associated with related policies in countries such as the Netherlands and the US, rather than relying solely on policy variation within Canada.

example is the declaration from the March 2000 meeting of the European Council in Lisbon. This established strategic goals for the EU, in a global context, to strengthen employment, economic reform and social cohesion as part of a knowledge-based economy. Monitoring progress in meeting such international targets necessarily requires international comparisons;

(e) the importance for national economic performance of relative international achievement in producing and using competences is likely to increase because of growing international integration in markets for labour, goods and services. For instance, there is evidence that adult competences are key to competitiveness and attracting foreign direct investment in high-tech sectors of business (Bartelsman et al., 2004).

In considering the merits of embarking on a new international skills assessment, a logical starting point is to examine the impact that other international assessments have had on policy-making. Of particular relevance is IALS.

IALS has, for the first time, collected reliable and internationally comparable data on the levels and distribution of broadly defined literacy competences in the adult population. Among many findings, IALS showed that up to a quarter of adults in countries such as Canada, the UK and the US possessed only level 1 literacy skills. IALS illustrated the critical role of education and learning for individuals throughout life and for the economy as a whole. Analysis of IALS data has helped to understand better how inadequate literacy skills hinder economic, political and social participation. IALS showed that in all countries older age cohorts experience an important skill deficit compared to younger age groups. Since its publication, IALS has provided a context for policy formulation in many countries. In particular, it has allowed policy-makers to make compelling arguments for policy reforms to improve the competence prospects for low-skilled adults.

A new international assessment could address a wider range of competences than IALS. It could also be administered over several assessment cycles and could be tailored to respond to predefined policy priorities. Accordingly, by comparison with IALS, a new assessment would likely generate data and analyses relevant to a wider spectrum of policy goals. It would also seek to enrich assessment of competences achieved by IALS. In particular, it would aim to develop instruments allowing higher resolution in assessing level 1 literacy skills, thereby assisting policy formulation for adults with a high risk of unemployment and social exclusion. The various ways in which a new assessment would differ from previous international skills assessments are summarised in Box 1.

3. Conclusion

This paper has described three areas of policy to which a new assessment would be relevant for policy-makers. However, it appears neither possible nor effective to address all the policy concerns identified in this document in a single assessment. This is not only due to considerations of technical and administrative feasibility, but also because in many areas insights on the effectiveness of policies will only emerge from repeated observations. It would thus be pertinent to spread the work involved over a series of successive survey cycles. These cycles would progressively expand the policy insights that an international assessment provides, with frequently recurring elements in policy domains where trends are important and less frequently recurring elements in policy domains where changes are expected to be slow and where policy benchmarks therefore have a long life cycle.

Box 1: How a new assessment could differ from previous international skills assessments

A new assessment will explore the simultaneous administration of direct and indirect assessment methods. If proven feasible, this novel approach could provide new insight on a range of education and labour-market policy concerns. For instance, data would become available on the extent to which competences are actually utilised in the labour market, allowing estimates of the proportion of people who are educated above the level required at work. Greater understanding could emerge on the optimal proportion of young people staying on in full-time education, and whether overeducation involves resource waste over the long run.

A new assessment would have greater country coverage than previous international skills assessments.

A new assessment would invest in developing an assessment instrument for new information and communication technologies (ICT).

A new assessment would invest in the development of new instruments to assess the competences of persons with the lowest level of skills.

A new assessment would be a multicycle programme of assessment. Having multiple cycles would allow analyses not possible through a single survey. It would permit, for instance, examination of the process of skill acquisition and loss over the lifecycle as well as policy analyses that require trend data. Having a multicycle character would also allow the progressive incorporation of new measurement instruments as they become available.

A new assessment would establish synergies with earlier initiatives (IALS, ALL and PISA) ([1]). For example, for countries that participate in both IALS and the new assessment, adopting a similar framework to IALS for measuring literacy would allow investigation over time of a range of policy issues associated with literacy. There would also be a potentially valuable chronological synergy with ALL. This is because the second round of data collection under ALL is set to occur between 2004 and 2006, with a first round of data collection under the new assessment possibly taking place in 2009. An option likewise exists for the development of synthetic cohort data based on PISA findings.

In a second or possibly third cycle, and contingent on an employers survey, a new assessment would quantify aspects of demand for competences. Past (national) experiences in assessing skill demand have been based on such indicators of skills as years of education, qualifications held and job vacancy numbers (by occupation/industry). These indicators represent an imprecise measure of skills, which in addition need not relate to the skills actually used in the workplace.

([1])   ALL stands for adult literacy and lifeskills survey and PISA stands for the programme for international school assessment.

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Review of systems of early identification of skill needs in the EU based on Cedefop/ETF information

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There is an abundance of information on systems of early identification of skill needs in EU Member States. The problem, however, is the information on systems, approaches and methods of early identification of skill needs is scattered and not comparable across Member States. Most information comes from national or subnational sources. The information bases formed in recent years by Cedefop and the European Training Foundation (ETF) have been produced by asking Member States to describe their systems of early identification of skill needs answering the same range of questions. Although still incomplete and not entirely comparable, these information sources are unique at present. This contribution uses the information bases to produce a short review of main trends and features in systems of and approaches to early identification of skill needs in Member States.

1.   Introduction

There is an abundance of information on systems of early identification of skill needs in EU Member States. The systems as such have already roughly a half-century history. They developed under different circumstances and served different objectives, and it is therefore not surprising that the systems differ greatly across countries. Nevertheless, there are clear similarities in trends in systems' developments and in approaches and methods used in various European countries.

The problem, however, is that the information on systems, approaches and methods of early identification of skill needs is scattered and not comparable across Member States. Most information comes from national or subnational sources. Occasional sector-level reviews produced at European level provide some partial information limited to specific sectors.

The information bases formed in recent years by Cedefop and the European Training Foundation (ETF) have been produced by asking Member States to describe their systems of early identification of skill needs answering the same range of questions. These templates, although still different for old and new Member States, produced a unique opportunity to gather comparable information within two groups of countries. The two information bases are therefore exceptional, even though their coverage is still far from full and their quality differs greatly from one country to another. Important is the foundation which can be improved and perfected in future.

2.   Information resources

Information resources used in this contribution were a combination of results of Cedefop and ETF information gathering. For old Member States (plus Iceland and Norway) Cedefop's knowledge management in vocational education and training (KMS) database eKnowVET was used as a primary source. This database was formed with the help of ReferNet network of

nationally based consortia. ReferNet supplies information on vocational education and training (VET) to Cedefop according to a specific template covering 11 themes (^{104}). Theme 7 'Skills and competence development and innovative pedagogy' and specifically its subtheme 'Mechanisms for the anticipation of skill needs' cover our interest. Additionally identification of skill needs is partially dealt with in other subthemes, such as 'Initial VET – planning and forecasting' (Theme 4) and 'Continuing VET – planning and forecasting' (Theme 5).

The database is filled gradually and the information is published after a quality check performed by Cedefop. Therefore, not all themes are covered for all old Member States yet and only a few new Member States have submitted information. The coverage also differs greatly from one country to another and at the moment does not provide a full overview of the systems of early identification of skill needs. The information gaps are expected to be filled in future for all countries, so the database can be harmonised. In the meantime some other Cedefop publications, produced mostly in the framework of Skillsnet activities, which cover issues linked to systems of early identification of skill needs in various countries, can be used (e.g. Karasiotou, 2004; Schmidt et al., 2004; Schömann et al., 2003).

The eKnowVet database also contains detailed thematic analyses of selected subjects. Information can be viewed by country or on a cross-country basis. Based on these detailed thematic analyses, a comparative presentation and analysis will be prepared in future (currently such comparative information is available only for guidance and counselling). Should ReferNet members, Cedefop and other partners decide that early identification of skill needs should be covered in more detail and a comparative analysis be produced, this would be possible through the created information gathering system and established channels. Thus, although the current information base is far from perfect, it provides a good basis for future information collection and analysis.

Information resources for new Member States and acceding countries have been kindly made available by ETF through their network of national observatories. This information was presented in short country reports in 2002 and 2003, particularly the section 'Skill needs assessment' and also partially covered in *Country monographs on VET and employment services*, particularly in the section 'Responsiveness of the education and training system to the needs of the labour market'. Contributions to both ETF reports provide only basic information on the systems of early identification of skill needs. Their quality and scope also differ greatly from country to country. The range of questions in the ETF template differs from the Cedefop's, but the information will be harmonised for all Member States under the auspices of Cedefop's eKnowVET database in future.

What information do these databases (both Cedefop's and ETF's) provide? First, there is a broadly defined description of approaches and methods of identification of skill needs in countries. The description does not go into detail, and is mostly limited to national level, i.e. information on identification of skill needs at regional and sectoral levels is limited or not available. Second, there is some mention of main institutions involved in the process, some (limited) information on decision-making processes as far as early identification of skill needs is concerned. Unfortunately, there is no information on funding the processes. The description of

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(^{104}) See http://www.trainingvillage.gr/etv/Information_resources/NationalVet/Thematic [cited 4.5.2006].

results of activities of identification of skill needs is not part of the database, nor is information on the ex post evaluation of quality of results. All in all, the information bases represent a point of reference for further information collection and it is certain we are better off than yesterday.

3. General trends in approaches and systems for early identification of skill needs in Europe

Although the comparability and coverage of the above-mentioned information bases are not complete, some observations of common trends in approaches and systems for early identification of skill needs in Europe can be made.

First, manpower planning assisted by computerised – mostly econometric – models as a major and only way of forecasting labour needs has become a matter of the past. At present there are two main functions of manpower forecasting: a policy function where forecasting serves as a point of reference, and an information function where the data available from forecasts of skill needs on the labour market is linked to guidance and counselling systems and thus requires fairly detailed and robust data, 'well processed' for the end-user and/or the level of further analysis and processing. Labour-market information becomes a public good going beyond serving a restricted group of experts, decision-makers and social partners. Also the prevailing question for future-oriented research into skill needs is not 'how many people in this profession will be required in 5 to 10 years?' but 'which professions and what kind of new qualifications and skills?' and 'what qualities of the workforce will be in demand?'. The new functions and research questions require non-mechanistic approaches and enriched methods, and therefore more than computerised manpower forecasting models.

The prevailing trend in Europe is, therefore, a holistic approach and combination of various methods seeking to achieve robust and reliable results. Forecasts have become one of many pieces of information that contribute to a more detailed, consistent and plausible picture. This is so in Finland, France, the Netherlands, the UK, etc.

Main methods used at present in Europe vary from quantitative and semi-quantitative approaches such as econometric forecasting models (national level, sometimes allowing spatial disaggregation), surveys among employers, skills audits; to qualitative, such as Delphi method, case studies, focus groups, sector scouting, trends counting; and finally combined/ holistic approaches, such as shared diagnosis, scenarios (including some proactive approaches to construction of the future – strategies, backcasting, etc.), observatories (sector, regional) and so on.

There is greater awareness of research activities in different countries and at various levels. Universal access to the Internet pushed forward not only publication of research results and sharing research methods but also creation of networks and related information platforms. These increased awareness of and cooperation among institutions, experts and projects on identifying skill needs at different levels. (Sub)national activities unite at national level and seek to go beyond national borders for research cooperation.

Generally, there is better access to higher quality – though still not fully satisfactory – labour-market information. Much effort in standardising data collection was put in by national statistical offices which mostly use classification systems which could be translated or are fully compatible at

European level. The role of Eurostat in collecting harmonised data brought significant improvement also at national level, especially in new Member States (for example, the labour force survey which is a major statistical input into national analyses of future skill needs). Nevertheless, the length of time series even in generally standardised and reliable statistics, sometimes is not sufficient for projections. This is especially so in new Member States, although problems with availability and quality of statistics also often appear in old Member States.

Early identification of skill needs, however, requires a high range of information and data on both supply and demand sides of the labour market. Such data are collected by different institutions – national, regional, sectoral, independent research centres, universities, NGOs – under the patronage of different State structures and various beneficiaries, and/or as one-off activities (e.g. project-based). Harmonisation and comparability of data, its reliability and robustness, and finally its long-term sustainability (comparability time-wise) depend on various factors and actors. It is still difficult to speak of a systemic and systematic approach to early identification of skill needs activities.

Weak points in early identification of skill needs in European countries still remain:

(a)   various efforts often take place in parallel;

(b)   research approaches and activities are not entirely transparent even at national level;

(c)   an holistic approach to early identification of skill needs depends more on 'entrepreneurial' skills and the initiative of a researcher than on a systemic arrangement: there are still very few collaborative teams/networks which have access to various information sources and use diverse tools and methods for analysing skill needs;

(d)   the time lag between producing useful – detailed and robust – analysis and incorporating the knowledge into VET courses still remains a problem: medium to long-term projection is needed to cater for the time lag but such projections are mostly not detailed enough and need to be enriched by other – qualitative-type – information, which takes time and exacerbates the time lag;

(e)   implementing research results into policy and practice remains the most difficult stage of any project or initiative: a lack of systemic arrangement does not help neutralise the conflict of institutional and/or political interests of different actors;

(f)   many efforts in Europe are similar but differ in specific methodological approaches and, therefore, the results are not comparable (e.g. enterprise surveys are frequent in many countries and ask similar range of questions formulated differently, using a differently defined sample, etc.).

As mentioned, there is a great variety of methods, although some are more frequent in certain countries than in others. This can be explained by cultural specificity, structures of cooperation with social partners at sectoral and national levels, and most importantly by the system of initial and continuing VET. There is no purity of this or that approach in a given Member State, as different methods are used by different institutions in each country. Yet, although somewhat oversimplified, a certain map of the most 'indicative' approaches across Europe can be drawn. For instance, scenarios and strategies are used more frequently in Anglo-Saxon countries, whereas observatories (sectoral and regional) which use (semi-) qualitative surveys and involve several different actors to produce so-called 'shared diagnosis' are frequent in France and in

southern Europe. Quantitative forecasting combined with elements of qualitative research and sector studies are typical for the Netherlands. Occupation/qualification-focused research caters for the VET systems in Germany and Austria.

In new Member States there are various methods but most are in a developing and testing phase, developed often in cooperation with an old Member State and thus borrow some features of the 'host' system (e.g. Dutch approach in the Czech Republic, Irish methods implemented in Estonia). New Member States try to balance what is desirable and feasible for implementation in their context and, therefore, select approaches which fit their own conditions. In these countries research into identifying skill needs is often developed around standards, updating curricula and setting up qualification frameworks.

4.   Some useful examples

These examples of good practice are in no way exhaustive and should be treated as illustrative of the main trends in early identification of skill needs mentioned above.

Combining quantitative econometric forecasting at national level with some additional well-processed information adjusted to clients' needs can, for instance, be found in the Netherlands, where very elaborate forecasting produced by ROA now attempts to incorporate spatial disaggregation to meet regional information needs. The results of national forecasts published as labour-market indicators adjusted to users' needs (qualitative description of labour-market prospects) are disseminated through the career guidance and vocational counselling system.

The shared diagnosis approach is popular among regional observatories of employment and training (OREFs) in France. Their sectoral contract of prospective studies include use of macroeconomic forecasts with other quantitative surveys data enriched by qualitative information. Intermediary and final results are broadly discussed with various actors (regional government, social partners, schools) and the final recommendation is produced by consensus. Although not entirely smooth, such an approach supports commitment and helps implementation of the agreed recommendations into policy and practice.

Networking in early identification of skill needs has been around for some time but it has now become massive and involves different kinds of institutions. Networks do not put together only research institutes or universities but a whole range of partners whose interest in the subject might make them useful as partners during research planning, implementation, dissemination and transfer into practice. One such example is the network on early identification of qualification needs FreQueNz in Germany. The network includes research institutions, universities, State institutions, business, social partners and others. FreQueNz implemented many innovative projects in close cooperation with their members, such as a method for regularly monitoring skill developments (IDQ), sector scouting and identifying trendsetters, research into new technologies and international qualifications, etc. FreQueNz, aware of the deficit of information on early identification of skill needs at European level, proposed creating network on early identification of skill needs at European level – Skillsnet. Other examples of successful networking include the 'glocal networks' in Spain in the Barcelona region combining information gathering on global sectoral trends in industry with local specific trends in skill

requirements. Also in Spain the observatory of the Spanish National Institute for Qualifications was created as a network of networks providing a metastructure for research and cooperation.

In many countries a permanent monitoring system of labour-market needs is linked to online provision of results, sometimes interactively (for example, an ongoing project in Italy which aims to set up a permanent national system for observing and forecasting skill and training needs – IT and network based; Austria's skills barometer). In some cases, online information on jobs and occupations – used in career guidance – is attempted to be linked to information on skill needs on the labour market (e.g. integrated system of typical working positions called 'ISTP' in the Czech Republic).

Overall, almost all countries have inbuilt mechanisms in their systems for updating qualifications and including new and emerging qualifications. Such mechanisms are mostly provided in an institutional setting (for example, sectoral committees). At regional and sectoral levels bipartite and tripartite bodies, which deal with initial and continuing VET and include expertise on skills and labour-market needs, can be found (for example, in Italy, the Netherlands, Norway). Many countries, however, went further by establishing cross-sectoral decision-making and expert bodies for early identification of skill needs (for example, expert group on future skill needs in Ireland, Human Resource Development Authority in Cyprus, interinstitutional team for forecasting work demand in Poland, etc.). There are perhaps emerging systemic arrangements in early identification of skill needs.

5.   Conclusion

There has been a shift in the objectives of identifying future skill requirements from knowledge of manpower demand in terms of numbers to knowledge on the kind of skills required and changes of job contents in different occupations. New objectives demanded different approaches. Thus, systems of early identification of skill needs have become sophisticated and complex. There is a clear trend to combine methods and efforts of different institutions and projects. The more complex approaches pushed forward collaborative modes of work and networking among institutions and experts at different levels. This supported greater awareness of research activities and methods among institutions, regions, sectors and countries. Better interinstitutional cooperation and communication of research results has been further reinforced by IT-based solutions.

Implementation of research results to policy and practice remains, however, the most difficult point. Despite creating complex structures (institutional, decision-making, involvement of social partners), it is still difficult to recognise a systemic process of early identification of skill needs. Research and analysis often appear as one-off activities. There is a lack of systemic approach to research planning, implementation and transfer as integral parts of a project cycle. Incorporating sector and regional activities into a systemic and systematic level is still rare.

Many efforts in Member States are similar but differ in methodology, and thus are not comparable. With greater mobility of labour in Europe, especially in specific sectors (such as tourism, ICT) knowledge of future skill demand of the European labour market is becoming imperative. The question then arises whether there is a European system of early identification of skill needs. We can conclude from the information available that the systems of early

identification of skill needs across EU countries, although having several similarities in features and development trends, are in fact very different. The methods and data also vary. At European level there is a deficit of early identification research activities and information collection. One exception is data in certain sectors covering several countries (such as skill needs in ICT). Standardised data collection across countries and sectors is, however, still limited. The data available from Eurostat, DG Employment, OECD and other bodies should however, be fully used for better EU-level comparisons of skill needs on the labour market and for identifying information gaps and data problems for their subsequent solution.

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Institutions and organisations

(in brackets: country)

ALI	Adult Learning Inspectorate (UK)
AMS	*Arbeitsmarktservice* / Labour Market Service (AT)
BLS	Bureau of Labor Statistics (US)
BMBF	*Bundesministerium für Bildung und Forschung* / Federal Ministry of Education and Research (DE)
CERGE-EI	Center for Economic Research and Graduate Education – Economic Institute (CZ)
CITB	Construction Industry Training Board (UK)
CPB	*Centraal planbureau* / Bureau for economic policy analysis (NL)
DfEE	Department for Education and Employment (UK)
DfES	Department for Education and Skills (UK)
DGB	*Deutscher Gewerkschaftsbund* / German Confederation of Trade Unions (DE)
DTI	Department of Trade and Industry (UK)
DWP	Department of Work and Pensions (UK)
ESRI	Economic and Social Research Institute (IE)
ETA	Employment and Training Administration (US)
FÁS	*Foras Áiseanna Saothair* / Training and Employment Authority (IE)
HETAC	Higher Education and Training Awards Council (IE)
IER	Institute for Employment Research (UK)
ITB	Industry Training Board (UK)
LDC	*Landelijk Dienstverlenend Centrum voor Studie- en Beroepskeuzevoorlichting* / National Careers Guidance Information Centre (NL)
LEC	Local enterprise council (UK)
LSC	Learning and Skills Council (UK)
NCVQ	National Council for Vocational Qualifications (UK)
NSTF	National skills task force (UK)
OFSTED	Office for Standards in Education (UK)
ONS	Office for National Statistics (UK)
OREF	*Observatoire régional emploi formation* / Regional training and employment observatory (FR)
PES	Public Employment Service (FR)
QCA	Qualifications and Curriculum Authority (UK)
ROA	Research Centre for Education and the Labour Market (NL)
SLMRU	Skills and Labour Market Research Unit (IE)
SSC	Sector Skills Council (UK)
SSDA	Sector Skills Development Agency (UK)
TEC	Training and Enterprise Council (IE)
WTO	World Trade Organisation
WZB	Wissenschaftszentrum Berlin für Sozialforschung / Social Science Research Center Berlin (DE)

Acronyms

CAD	Computer-aided design
CEP	*Contrat d'étude prospective* / Contract of prospective study (FR)
CNC	Computer numerical control
COP	*Contrat d'objectif territorial* / Contract of territorial objective (FR)
CVT	Continuing vocational training
ECISD	Extent, causes and implications of skill deficiencies
FTE	Full time equivalent
GDP	Gross domestic product
HRD	Human resources development
IALS	International adult literacy survey
IFLM	Indicator of future labour market prospects
IFRP	Indicator of future recruitment problems
ISCED	International standard classification of education
ISCO	International standard classification of occupations
LFS	Labour force survey
LMI	Labour market information and intelligence
NFQ	National framework of qualifications
NOMIS	National online manpower information system
NVQs	National vocational qualifications
PLC	Post leaving certificate
RISA	Regional labour market information system on school graduates
SFPP	Sustainable forestry pilot project
SIC	Standard industrial classification
SME	Small and medium-sized enterprise
SOC	Standard occupational classification
TNA	Training needs assessment

Early identification of skill needs involves very different approaches in research and analysis performed by several institutions at various levels. The present volume results from proceedings of the conference which was organised in Dublin jointly by the Irish expert group on future skill needs, the Irish Training and Employment Authority (FÁS), and the European Centre for the Development of Vocational Training (Cedefop), particularly its international network on early identification of skill needs, Skillsnet. The conference discussed the strengths and weaknesses of diverse systemic, institutional, political and other contextual arrangements of early identification of skill needs across countries.

The volume gives an overview of systems of early identification of skill needs in the Czech Republic, Estonia, France, Germany, Ireland, the Netherlands, Romania, the UK, the US and other countries. The publication also presents the results of two workshop discussions. The first one focused on how different levels of identification of skill needs – national, regional, sectoral – can complement each other and contribute to the national system. The second workshop focused on the implementation of research results in early identification of skill needs into policy and practice. The workshop participants attempted to grasp how the transfer can be ensured, how it can be embedded in the system, and whether research is linked to the system of counselling and guidance. The final part of the volume looks at some initiatives and information sources in the field of early identification of skill needs at European level.

Systems, institutional frameworks and processes for early identification of skill needs

P A N O R A M A

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