Skills in England - Volume 1

2002

Learning+Skills Council

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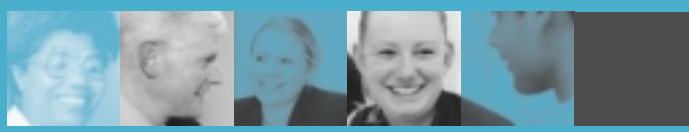
Chapter 1: Introduction: The Measurement and Value of Skills



Chapter 1

Introduction: The Measurement and Value of Skills

Overview and Summary

1.1 The continuing assessment of skills and skills needs is important for the economy, for firms, and for individuals. This *Skills in England 2002* has been commissioned by the Learning and Skills Council (LSC) to describe, review and assess the latest information available on skills and skills needs in England.

This report examines the available evidence on skills and skills needs in England...

1.2 A considerable body of evidence on skills was collated and reviewed in *Skills in England 2001* (Campbell *et al*., 2001). In this report, that evidence is updated and extended, with an additional focus on the sectoral and local area information. This is contained in Volume 2 of this *Skills in England 2002*.

with a particular focus on sectoral and local area information.

1.3 In this introductory chapter, the aims and scope of the *Skills in England 2002* are outlined and the different ways in which 'skills' and 'skills needs' can be defined, measured and valued are examined.

This chapter describes the scope and structure of the report...

1.4 There are many issues in producing consistent definitions of skills and skills needs since there are many different dimensions to skills. These make comparisons of skills and skills needs over time and between countries particularly difficult.

and examines how skills can be defined, measured and valued.

1.5 Four main ways of measuring skills can be identified:

- by the qualifications that individuals possess;
- by workers' occupations – the jobs they do;
- by employees' self-assessment of their skills, abilities and attributes; and
- by employers' assessment of employees' skills.

Each of these methods for measuring skills is briefly examined in this chapter.

1.6 Although care is needed in interpretation, together the four measures provide a more comprehensive picture of the scale and scope of skills and skills needs in England than has been previously available.

1.7 The value of skills to individuals, to firms, to the economy and to society more widely is also briefly described in this chapter. The evidence indicates that individuals with more skills generally earn higher wages and are more productive, and that higher levels of skills can contribute to economic growth. There are also wider social benefits of a more skilled society.

The value of skills to individuals, firms and society is also briefly discussed.

1.8 Finally, an outline of the structure and content of the remainder of the report is provided. This includes reviews of the demand for skills, the supply of skills, skill deficiencies and imbalances, and an assessment of future skill needs.

Finally, the report's other chapters are described.

Introduction: Aims and Objectives of the *Skills in England 2002*

Skills are important for individual labour market outcomes, for productivity and for economic growth.

1.9 It is widely recognised that skills are important for understanding wage levels and wage inequality, in determining individuals' employment prospects and outcomes, for productivity and for long-term economic growth (see, *inter alia*, Machin, 1999; Temple, 2001; HM Treasury, 2002; Sianesi and Van Reenen, in press; Harmon *et al*., in press). Thus, understanding the complexities of skills and skills needs is crucial for personal, economic and social development.

1.10 In addition, it is becoming increasingly clear that skills in Britain are relatively poor in comparison with other OECD countries, particularly with regard to basic numeracy and literacy, and also technical and vocational skills.

There are a number of initiatives aimed at improving the low level of skills in Britain...

1.11 The importance of skills, coupled with their low levels in Britain and an increasing demand for higher level skills in particular, have together generated a substantial increase in effort towards improving the skills of the workforce. Initiatives now exist at every level, from literacy and numeracy hours in early school years, through 'key skills', to the establishment in April 2001 of the local Learning and Skills Councils (local LSCs) responsible for post-compulsory education and training in England.

and these need to be continually assessed for their effectiveness.

1.12 These developments demonstrate the strong commitment to improving the skills of Britain's workforce. However, skills and skills needs must be regularly and continually assessed in order to ensure that the different schemes and initiatives are being targeted effectively and efficiently, and to verify that they are meeting their objectives.

This report describes the current state of skills and skills needs in England...

1.13 The principal aim of the *Skills in England 2002* is to contribute to the assessment of skills and skill needs in England by documenting and analysing the available information. In part, it updates and expands upon the considerable body of evidence presented in a previous review, *Skills in England 2001* (Campbell *et al*., 2001).

focusing on the sectoral, regional and local dimensions.

1.14 As well as describing the aggregate demand and supply of skills, and any imbalances and deficiencies they reveal, this report focuses on disaggregating the overall picture. In particular, information at the sectoral, regional and local level is reviewed and analysed in detail. It is hoped that this additional focus will be particularly useful to the Sector Skills Councils (SSCs) and the 47 local LSCs in England.

Skills supply, skills demand, skill deficiencies, skill inequalities, skill comparisons between countries and over time are all described and discussed.

1.15 Thus, the aims and objectives of this report are:

- to collate and synthesise the evidence on the supply of and demand for skills, including the identification of areas where imbalances and skill deficiencies exist;
- to highlight the sectoral, regional and local area characteristics of skills supply and demand;
- to assess how the situation with regard to skills needs has changed since *Skills in England 2001* was published;

- to identify the major skill deficiencies, assessing their relative importance and proposing priority areas for action for consideration by the LSC and its partner organisations;
- to review the evidence on skills in the light of the LSC's Equal Opportunities objective, with a particular focus on the data by gender and ethnicity;
- to compare and contrast the situation in the UK with that which exists in other European and OECD countries;
- to summarise the available evidence on the relationship between skills and social exclusion; and
- to identify knowledge-gaps where further research is necessary for improving skills policy and targeted interventions.

Skills and Skills Needs: Scope, Approach and Definitions

Skills need to be clearly defined.

1.16 In order to document the available evidence on skills and skill needs requires, firstly, a clear understanding of what is implied and understood by the term 'skill' and, secondly, a compendium of the available measures of 'skills'. Therefore, it is useful to reflect briefly upon how 'skill' is defined in the mainstream literature.

They reflect competence, but are also related to knowledge.

1.17 This need for a definition of skill was also noted by the National Skills Task Force (NSTF, 2000b: p.21) which suggested:

'At the core of the term skill is the idea of competence or proficiency ... Skill is the ability to perform a task to a pre-defined standard of competence ... but also connotes a dimension of increasing ability (i.e. a hierarchy of skill). Skills therefore go hand in hand with knowledge'.

However, the National Skills Task Force definition of skill does not identify any unique, objectively-defined measures of skill.

Skills can be defined by the characteristics of individuals or of the jobs they do.

1.18 Two broad, practical, approaches to defining skill can be identified in the literature. First, skills can be defined by the attributes of individuals – their formal qualifications, and/or the skills that individuals say they possess. Secondly, skills can be defined by the characteristics of the jobs that people do – their occupations, or employers' assessment of the work that they do and the skills they use. Clearly, these two approaches can lead to rather different assessments of skills and skills needs.

There are many dimensions to skills.

1.19 Even within these two broad approaches, there is still considerable scope for disagreement as to what constitutes a skill, and how much of that particular skill individuals possess, or use in their jobs. Various literatures – from sociology, psychology and economics - have all attempted to give meaning to the word 'skill' and made suggestions as to how it might be measured.

Sociologists...

1.20 Sociologists have tended to focus historically on the social construction and social context of skills. They note that the language of skills has been used to further the specific interests of certain groups - such as the professions and trades unions - largely independent of the actual nature of the jobs or the skills of the individuals concerned. The second strand in the sociological literature concentrates on the changing nature of work. Historically, this literature highlighted 'deskilling', but more recently has examined the consequences for skills and workplace organisation of globalisation and, in particular, the creation of a high skills economy (Brown *et al*., 2001).

economists and...

1.21 Economists' concepts of skills have typically been based on quantitative measures of formal academic qualifications, work experience and training. While narrowly defined within the human capital paradigm that dominates economists' analysis and understanding of the wage setting process, one key advantage of their approach is that they provide estimates of the rates of returns to skills. That is, they can provide a valuation of skills in the workplace. This is important in order to understand whether and to what extent the investment individuals, firms and society make in skills has positive outcomes, at least in terms of the wages that individuals earn. The valuation of skills in a wider, societal sense, is more difficult to assess however. Moreover, the set of skills that are assessed is rather narrowly defined, particularly given the nature of jobs in the modern workplace environment (Stasz, 2001).

psychologists...

1.22 Psychologists have made considerable progress in recent years in terms of measuring skills used. In particular, methods of formal job analysis have been used in an attempt to provide objective measures of differences between jobs. The questionnaires used to establish exactly what an individual does in their job are extremely detailed and typically provide information on 'know how', 'problem solving' and 'accountability' (see, for example, O'Shaughnessy *et al*., 2001). Indices of 'skills' can then be constructed for each job. These job evaluations are then used to help companies set pay for comparable jobs. The use of such methods is widespread in the US for example.

all give rather different meanings and interpretations to skills.

1.23 Clearly, these three different perspectives provide rather different concepts and thus definitions of skills and skills needs. Each has its own advantages and disadvantages. Some recent attempts to measure skills have endeavoured to combine the best features of all three approaches.

Skills are difficult to define, to measure and to value.

1.24 The scope and limitations of any assessment of skills in England are clearly partly dependent upon the definitions of skills and skills needs utilised. Moreover, these definitions have implications for skills measurement and any assessment of the value of skills. Skills are difficult to define precisely and objectively – they are multi-dimensional, multifaceted, nebulous and heterogeneous in nature. Even if agreement could be reached about some appropriate definitions of skills, the problems of measurement and valuation still remain.

Comparisons over time and between countries are particularly difficult to make.

1.25 The problems that are highlighted in defining and measuring skills and skills needs are exacerbated when it comes to comparing skills over time, and, especially, between countries as shown in Chapter 2.

1.26 In the next section, the main approaches to defining and measuring skills and skills needs are described and evaluated. The focus is on some of the more recent developments in this literature which have enabled broader definitions of skills to be measured and assessed for the first time. In the subsequent section, the report then briefly examines how the value of skills to individuals, firms and the economy can be assessed.

The Measurement of Skills and Skills Needs

Definitions of 'skills' are becoming broader.

1.27 The interpretation given to the term 'skills' is undoubtedly changing. As noted by Borghans *et al*. (2001), the unskilled manual worker of yesterday would today be attributed with physical skills, stamina, and fortitude. These and other generic qualities of the workforce such as communication skills and team-working ability are increasingly being labelled as 'skills'.

Generic skills - such as team-working - are now included in definitions of skills.

1.28 Thus, the definitions of skills are becoming wider to encompass a broader range of attributes. Some would even include personal attributes such as motivation that previously would never have been regarded as skills but yet are clearly important to the ability of individuals to be productive in the world of work. Given the novelty of the broader definitions that are now regarded as skills, there is perhaps more scope for differences in meaning and interpretation than ever before.

New data sources have been compiled to measure these 'new' skills.

1.29 Undoubtedly, partly as a consequence of the realisation of the increasing importance of skills, greater effort has been made in recent years to improve and broaden the measurement of skills and skills needs. As a result, a number of new sources of data have become available.

1.30 Hence, in addition to traditional measures of skills based on formal educational qualifications or occupational classification, representative surveys of employers and employees are now also available which can be used to provide reliable measures of generic and other skills for the first time. In addition, these surveys provide a much better understanding of skills deficiencies and skills needs.

1.31 In the following four sub-sections, the main methods used throughout this report for the measurement of skills and skills needs are described and their major advantages and disadvantages are highlighted.

Qualifications-based measures of skills

Skills can be measured by educational qualifications and other standardised tests.

1.32 Traditionally, skills have been measured by the educational qualifications held by individuals. Given the variety of certificated qualifications that now exist, it is helpful to group them into levels in order to accommodate changes in the nature of certification over time and to facilitate rough comparisons between attainment levels within different qualification structures. A typical grouping into five bands as used by the National Skills Task Force is utilised elsewhere throughout this report. This is based around the National Vocational Qualification (NVQ) structure and is detailed in *Annex A, Table A1*. There is also an International Standard Classification of Education (ISCED) based on the highest education level completed and is therefore linked to years of study and age rather than qualifications attained. This typology is summarised in *Annex A, Table A2*.

1.33 The main advantage of qualification-based measures of skills is that it is relatively simple and straightforward to make comparisons between and within different subgroups of the working population and over time (as long as standards and qualifications remain fairly consistent).

Qualifications are useful for comparisons, especially between countries...

1.34 Qualification-based measures are also more amenable to international comparisons. Recent work by Barro and Lee (1993, 1996, 2001) has focused on international comparisons of years of education and educational attainment. Other work has provided standardised, non-certificated, test scores for both students with the Third International Maths and Science Study (TIMSS) (International Association for the Evaluation of Educational Achievement (IEA), 1996), and for adults with the International Adult Literacy Survey (IALS) (OECD and Statistics Canada, 1995; OECD *et al*. 1997). Finally, the OECD provides a regular assessment of a wide range of comparative indicators of the inputs and outputs of educational systems. They use the ISCED system as the basis for comparing education systems between countries (see, for example, OECD, 2001a; Steedman and McIntosh, 2001).

but they provide only a limited measure of skills used in a job.

1.35 Using qualifications fails to record the skills individuals actually use in their jobs and there is some evidence to suggest that there is substantial mismatch between qualifications held and those required in a job. In particular, overeducation – whereby job holders have qualifications in excess of those required to get or to do the job they have – would appear to exist (Battu *et al*. 2000; Green *et al*. 1999). Some recent surveys have asked respondents to record the qualifications required to get the job, and/or needed in the job that they have, and this can help to alleviate this particular measurement problem as well as provide an estimate of the extent and degree of qualifications mismatch (Felstead *et al*. 2002). It is important to note also that qualification and skill mismatch are different concepts and may have rather different effects, especially on wages and job satisfaction (Allen and van der Velden, 2001).

1.36 Qualifications held are only a very imperfect proxy for an individual's skills and abilities. Individuals with equal levels of education may have rather different quantities and qualities of skills, and the skills they have may have different values in the labour market. Focusing on educational qualifications also fails to adequately deal with problems of 'credentialism' whereby employers demand increasing levels of qualifications for employment while jobs are essentially unchanged in their skill requirements. Nor does the focus on qualifications take account of the fact that they may be used by employers and employees simply as a signal of potential productive ability, rather than indicating that the individual has higher skills.

1.37 Finally, education is typically completed at a relatively early age and effectively depreciates over time. In contrast, most skills develop over time, and new skills are acquired while in work both formally (in on-the job and off-the-job training), and informally (through learning-by-doing).

Nevertheless, qualifications are widely used as a measure of skills.

1.38 Despite these weaknesses, and the fact that employers frequently cite previous work experience as more important than education, formal qualifications are widely and frequently used as an absolute and comparative measure of skills both nationally and, as noted above, as a basis for international comparisons.

Occupation-based measures of skills

Occupations can be used as a proxy for skills.

1.39 The use of occupational classifications as a measure of skills, particularly where occupations are classified and grouped according to some notional hierarchy of skill levels clearly accords well with the National Skills Task Force definition of skills. The Standard Occupational Classification 2000 (SOC2000) as used in Britain can be categorised using a hierarchical structure as illustrated in *Annex A, Table A3*. The organising principles of the SOC2000 are described in detail in Elias *et al*. (1999).

1.40 An important advantage of occupation-based measures of skills is that changing skill requirements can be measured by changes in the occupational structure of employment. Moreover, by forecasting occupational changes, it is possible to produce a forecast of future skills requirements (Wilson, 2000).

1.41 In addition, there is an international standard for occupational classification - ISCO-88 (COM) (ILO, 1990) - which facilitates comparisons between countries. Elias and McKnight (2001) discuss the international comparability of occupational data between countries.

However, changing skills within occupations will not be revealed by such measures.

1.42 However, one important weakness with occupation-based measures of skills is that skills may be changing over time *within* occupations. For example, Murnane and Levy (1996) calculate that someone now building cars in Detroit requires education to age 14, whereas it used to take more skill to drive a Ford than to build one. More generally, the widespread increasing use of computing skills in many occupations in recent years will not be reflected in any occupation-based measurement of skills. Nor can such methods measure or reflect generic skills which are also seen to be of increasing importance at all levels of employment.

1.43 Mismatch is also an issue here, as with qualification-based measures of skills. The skills that an individual possesses may be different from those that competence in the occupation requires.

International comparisons using occupation-based measures of skills are still problematic despite the international classification system.

1.44 Finally, it is clear that despite the existence of a common international classification system, there is still scope for considerable differences in the way in which the system is interpreted and applied. For example, the occupational structure in the UK defines approximately 14% of workers as being managerial, as compared to an average of around 8% in the rest of the European Union (Elias and McKnight, 2001). Clearly, workplace organisation does not differ this significantly between the UK and the rest of the EU. Rather, this discrepancy is, at least in part, a reflection of differences between countries in the interpretation and use of the term 'manager'. Such large differences caution the use of occupation-based measures of skills for international comparisons.

Individuals' self-assessment of skills

1.45 Two recent surveys which have broadened the available measures of skills are the *Skills Surveys* which took place in 1997 and 2001 (Ashton *et al*. 1999; Felstead *et al*. 2002).

The Skills Surveys can provide measures of both formal qualifications and generic skills, as well as computing skills.

1.46 The *Skills Surveys* are employee-based representative surveys conducted through computer-aided personal (face-to-face) interviews. As well as gathering a range of background characteristics of the respondents, including their formal educational qualifications, both surveys also asked a sequence of questions designed to elicit information on the skills that respondents use in their jobs, and also the extent to which employees made use of the skills they possessed. The surveys permit the identification and measurement of a range of generic skills amongst the British workforce for the first time.

1.47 The methodology in the *Skills Surveys* is directly borrowed from the job analysis studies conducted by occupational psychologists and used in job evaluation studies. The set of questions asked is presented in *Annex A, Table A4*. The responses to these questions are then used to generate a set of measures of generic skills. Computing skills – as reflected in computer usage and the complexity of that usage – are also separately recorded.

10 generic skills used in jobs can be identified in the Skills Surveys.

1.48 Dickerson and Green (2002) describe in detail how the responses to the questions on job activities are used to identify a taxonomy for generic skills which comprises the following attributes:

- literacy skills;
- physical skills;
- number skills;
- technical know-how;
- high-level communication;
- planning skills;
- client communication;
- horizontal communication;
- problem-solving;
- checking skills.

A more comprehensive description of each of these generic skills is provided in *Annex A, Table A5*.

Task discretion and variety are also important skills.

1.49 The two *Skills Surveys* also ask a number of questions regarding other generic features of jobs related to the skills utilised, including task discretion and variety. Task discretion is clearly a skill, and can also be regarded as a reflection of trust in the ability and conformity of the worker. Indeed, task discretion has been a focus of sociological analyses, including Braverman (1974), Friedman (1977) and Spenner (1990). Task variety also requires a wider range of skills from employees.

1.50 The *Skills Surveys* are thus a unique source of data and permit an analysis of the growth and valuation of a considerably broader range of skills than has been previously available.

Employers' assessment of skills

1.51 There are now a number of data sources which have gathered information on skills, skills needs and skills shortages from employers. These include: *Employee Manpower and Skill Practices Survey* (EMSPS) 1991 (Haskel and Martin, 2001), *Skill Needs in Britain* (DfEE, 1997), and, more recently, the two *Employers Skill Surveys* which were conducted in 1999 and 2001 (Bosworth *et al*. 2000, 2001; Hogarth *et al*. 2001). In addition, many local and regional bodies have commissioned their own Employers Skill Surveys.

1.52 The two *Employers Skill Surveys* are large, nationally representative surveys of skills recorded at the level of the establishment. The respondent is typically the senior person responsible for the human resource function at the establishment. Both surveys were conducted by telephone interview, although there were also large numbers of face-to-face interviews for the 1999 survey. A further survey was conducted in 2002, albeit on a much smaller scale (Hillage *et al*. 2002).

The Employers Skill Surveys can provide measures of external skill shortages, and internal skill gaps.

1.53 These surveys facilitate the identification of the nature of skill shortages and skills gaps as revealed by the demand side of the employment relationship. In particular, it is possible to distinguish:

- *external skill shortages* or recruitment difficulties as reflected in vacancies which are deemed hard-to-fill because of perceived or actual skill-shortages amongst the applicants, or a lack of the work experience or qualifications that the company demands;
- *internal skill gaps* arising from a lack of full proficiency in performing their jobs among the existing workforce; and
- *latent skill gaps* for which employers fail to perceive the skills needed to improve and optimise their organisation's performance.

1.54 It is important to note that there is some debate as to how skill shortages should be defined and measured (Green and Ashton, 1992). In this report, the definitions of external skill shortages and internal skill gaps are those employed in the National Skills Task Force reports and in previous work which utilises the *Employers Skill Surveys*.

In conclusion, none of the four measures is entirely satisfactory.

1.55 In conclusion, there are clearly a number of different ways in which skills and skills needs can be defined and measured. None of the four broad data sources that have been described is entirely satisfactory as a means of measuring skills and skills needs. Individuals possess different levels of a broad range of skills, which they then utilise to different degrees in the jobs they do. Thus neither individual-based measures, nor jobs-based measures will be able to capture all aspects or dimensions or extent of usage of skills and skills needs.

Hence, a combination of all four measures is used to ensure that the coverage of skills is as broad as possible.

1.56 Moreover, given the nature of the measurement difficulties, some of the evidence on skills can be interpreted as reflecting both the demand for and supply of skills. Rather than restrict the coverage of the *Skills in England 2002*, an eclectic approach is adopted in the remainder of this report. Definitions and measures of skills and skills needs derived from all four of the different

types of data are considered. While this necessarily produces a greater range of measures for discussion and interpretation, it does ensure that the coverage of skills and skills needs is as comprehensive as possible.

The Value of Skills

1.57 It is important to be able to measure the value of skills in order to gauge their importance to individuals, to employers and to society as a whole.

Skills are valuable...

1.58 It is well established that there is a strong link between qualifications and earnings. All else equal, more qualified people tend to be better paid. More recently, evidence has begun to emerge that employers also set a value on other aspects of individuals' skills not directly linked to their qualifications.

to individuals, to employers and to society more widely.

1.59 Measuring the benefits of education and training is complex and can be considered at various levels and from differing perspectives:

- at an individual level, the impact of education and training on the earnings of those who are employed, and on the chances of being employed or unemployed, can be examined;
- the impact of education and training on organisational performance can also be assessed. Critical here is the extent to which employers engage in training their staff and provide employees with skills which have some value in the labour market; and
- at the macro-level, the impact of education and training on aggregate output, growth and employment, as well as on a range of non-economic outcomes, can be estimated.

The value to individuals

For individuals, the main beneficial effect of investment in education or training is on their earnings.

1.60 For individuals, the beneficial effects usually focus on the impact on earnings. This can be measured as a premium associated with education or training, typically using years of schooling or qualifications as a measure of the educational input. Alternatively, it can be expressed in terms of a rate of return on investment in human capital, where the main costs are the earnings or income foregone during the period of education or training.

1.61 Typically, rates of return are computed for various qualifications or for the length of time spent in education or on training courses. The rate of return expresses the value of an additional year of education (or the value of a particular qualification) in terms of the associated percentage increase in earnings.

The returns to investment in education to the individual are substantial.

1.62 Generally speaking, individuals with higher level qualifications have higher earnings. According to a large number of studies, investment in individuals' human capital has a very high return (OECD, 2001a; Psacharopoulos, 1994; Trostel *et al*, 2002). For developed countries, each additional year of schooling results in an average real return of around 5% in terms of earnings. In the UK, the rate of return is above average at around 8% (Harmon *et al*. 2002).

Employers also value key and generic skills.

1.63 Recent research suggests that it is not just formal qualifications which are valued by employers. A range of key and generic skills also attract a wage premium (Dickerson and Green, 2002). In particular, computer skills are highly valued, even at moderate levels of complexity, with workers commanding a wage premium (after controlling for other factors, including education) of around 14% compared to those who do not use computers.

Investment in vocational training also has a payoff. There are also significant benefits to improvements in basic skills.

1.64 There is also a strong body of evidence which indicates that there are significant returns to individuals from investment in training (Machin and Vignoles, 2001). The international comparative study by the OECD (1998) demonstrated that the benefits were particularly high in the UK. Other UK evidence indicates a similar return to training as for formal education. The benefits are especially marked for those with lower levels of educational attainment (Blundell *et al*., 1996), for women, and where the training is of the off-the-job variety (Blundell *et al*., 1999). Other research indicates a strong payoff to improvements in basic literacy and numeracy (Dearden *et al*. 2000, 2001; Bynner *et al*. 2001).

The benefits of investment in education and training are not solely in terms of pay but also employment.

1.65 The benefits of skills are not solely in terms of pay. There is a steady reduction in the probability of being unemployed as qualification levels increase. In addition, the probability of obtaining employment is also significantly enhanced by acquiring basic literacy and numeracy skills (Dearden *et al*. 2000, 2001; Bynner *et al*. 2001).

The benefits to organisations

Benefits to organisations are more difficult to quantify...

1.66 The benefits of the acquisition and deployment of skills at an organisational or company level are more difficult to assess than for the individual. However, a range of research has begun to quantify the nature of these benefits.

but they are wide and varied,...

1.67 Briscoe and Wilson (2002) highlight the enormous range of ways in which the acquisition and deployment of skills enhance company performance. An important conclusion from many studies is that there is a higher return on training when it is associated with a wider 'bundle' of human resources practices (Blundell *et al*. 1999; Bosworth *et al*. 2001; Cosh *et al*. 2000).

including significant benefits from vocational training

1.68 Barrett *et al*. (1998), in a review of the specific effects of enterprise training on company performance, conclude that training does have a significant positive effect on productivity. Often these benefits are transferable: training received from one employer increases productivity with another employer, but the type of training is important to outcomes, as is its combination with other human resource policies and practices.

1.69 It is also useful to examine the impact of education and training on general organisational performance. Critical here is the extent to which employers engage in training their staff and provide employees with transferable skills in the labour market (Stevens, 1999).

The benefits to the economy and society as a whole

Education can contribute to economic growth at a macro level.

1.70 There is a growing body of evidence concerned with the ways in which education affects economic productivity and growth at a broader macro level. Although there is some debate about the precise nature of the relationships involved, there is a general consensus that education, and investment in human capital more generally, has made a strong contribution to economic growth throughout the world.

1.71 There is also evidence that the total returns to investment in education and training may be greater than the sum of the individual returns. This reflects the belief that such investments may have so called 'external benefits' which are reaped by other than those making the original investment. These benefits can also be measured in direct economic terms (Sianisi and Van Reenen, in press).

The benefits also include social factors such as improved health and reduced crime rates.

1.72 The social benefits may also include various non-economic benefits such as reduced crime and better health. While some of these benefits may accrue to the individual, many affect third parties. Although there are increasing attempts to quantify them in economic terms, this work remains in its infancy. The early results suggest that such benefits could be substantial (see, for example, Elias *et al*. 2002, Chevalier *et al*. 2001 and Bynner and Egerton, 2001).

1.73 Cross-country analyses suggest that differences between countries in the 'stock' of human capital can help to explain differences in conventional measures of economic growth. In a review of this work, Sianesi and Van Reenen (in press) note that the latest evidence suggests that increasing school enrolment rates tends to increase not just the level of GDP but also its rate of growth. On average, an additional year of secondary level education for the population as a whole increases the rate of economic growth by an additional one percentage point a year. Although some aspects of these results remain controversial, they are indicative of the very crucial role that investment in education, training and skills can play.

It can also bring benefits at a more localised level.

1.74 There is some more limited evidence on the economic benefits of learning for localities. A number of micro level studies suggest an important role for education and training in explaining the dynamics of local economic development.

1.75 Within the UK, Campbell (1999) provides evidence not only of the substantial variations in skill levels across England but also of the relation between these and a range of indicators of economic performance. At an international level, the OECD (OECD, 2001b) provides indicative evidence of the links between skills acquisition and economic growth at the regional level, across the 15 EU member states.

Over-qualification and qualifications inflation

However, there is no guarantee of a payoff...

1.76 On average, it appears that there are substantial benefits to investment in education and training. However, as with any other investment, there is no guarantee that any specific investment will have a positive payoff. It is important that the investment is targeted so that the resulting qualifications and skills are those actually required.

and inappropriate investment can be wasteful of resources.

1.77 Investment in the wrong areas may fail to generate any benefits. In many developing countries, such as India, there have been concerns about producing too many graduates. Even in the UK, some have questioned the value of trying to achieve a target of 50% of young people entering higher education (Institute of Directors (IOD), 2002). Unless these students can be usefully employed in jobs that make use of what they have learned, there is a danger that such investment may have no benefit.

However, education is not just undertaken for direct economic benefits.

1.78 Of course, as already noted above, education is not solely about economic payoffs. It can generate a wide range of other beneficial effects for both the individual and society in general. These can include such things as becoming a better citizen, which may itself have some important economic payoffs in terms of health and well-being (Elias *et al*. 2002).

Qualifications may simply be used as a screening device by employers.

1.79 Within the UK, and similar economies such as the US, there has also been concern that the apparent payoff to investment in education and training, especially to degree level, may simply reflect a 'screening' effect. The premium associated with holding a first degree, for example, may simply reflect the fact that employers use these credentials as a signalling device to select more able and productive individuals. The earnings premium that such individuals then receive reflects their above average ability, rather than any value added by the education process.

There have been some concerns about qualifications inflation and over-qualification...

1.80 Associated with screening/signalling are the concepts of over-qualification and qualifications inflation:

- over-qualification refers to a situation in which the individual doing a job has more qualifications than are required; and
- qualifications inflation exists when higher and higher qualifications become a necessary entry requirement to do essentially the same job.

These two concepts are concerned with the notion that many individuals do not really need to be as well-educated and well-qualified as they are in order do their jobs competently and successfully. These issues are addressed directly in the discussion in Chapter 5 which examines new evidence on what individuals do in their jobs, and how this relates to their qualifications.

but the evidence suggests a continuing growth in the demand for higher level skills.

1.81 On balance, the evidence seems to suggest that, while such problems undoubtedly exist, they are not dominant. For example, sensitivity tests of the value of education purely as a signalling device suggests that function accounts for just a small fraction of estimated rate of return (Harmon *et al*., 2002). Many jobs are becoming more complex and demanding and require higher levels of skill. Indeed, the evidence suggests that the increased demand for skilled labour has more than offset the dramatic increase in the supply of qualifications in recent years. Thus, investment in the right skills has an important contribution to make to future prosperity for individuals, organisations and society in general.

The Structure of the Report

Chapter 2 presents a summary of international evidence on the value of skills.

1.82 Following this introductory chapter to Volume 1 of the *Skills in England 2002*. Chapter 2 provides a more general assessment of the international evidence on the link between investment in skills and economic performance. This helps to contextualise the situation in the UK relative to the rest of Europe and other OECD countries. Participation rates in schooling and further and higher education, as well as achievement rates, are examined and contrasted.

Chapter 3 describes the demand for skills.

1.83 The remaining chapters of the *Skills in England 2002* examine the skills situation in England in detail. Chapter 3 describes the *demand* for skills. Current issues and trends in the demand for skills, including more forward looking aspects, are examined. Disaggregated occupational, sectoral and local trends and differences in skills are described in broad terms, and patterns in qualification requirements and generic skills are outlined. Further details of the sectoral and local dimensions of skills and their differences are provided in Volume 2.

Chapter 4 describes the supply of skills.

1.84 Chapter 4 examines the *supply* of skills, with an emphasis on individuals' qualifications and their workplace training. This chapter also includes an examination of the rates of return to qualifications and training as a measure of the value of these skills in the labour market.

Chapter 5 examines skills deficiencies and imbalances.

1.85 Chapter 5 brings together the supply and demand for skills and examines skills deficiencies and imbalances. These deficiencies and imbalances are indicated by the evidence on wages, rates of return, unemployment and economic inactivity rate. In addition, information from the *Employers Skill Surveys* provides evidence on national trends in skill deficiencies and imbalances, including skill shortages resulting in recruitment problems and skill gaps amongst existing workers.

Chapter 6 assesses future skills needs in Britain.

1.86 Future skill needs and supplies are examined in Chapter 6. Forecasts and other assessments of the demand and supply of skills are presented at the sectoral, occupational and regional level. Predicting the future demand and supply of skills is a difficult exercise, but forecasting broad trends and patterns is important if widespread skill deficiencies and imbalances are to be avoided in the future.

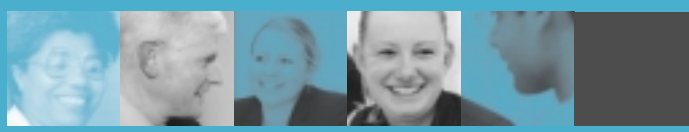
Chapter 7 presents the key challenges on skills for the future.

1.87 The final chapter of Volume 1 concludes by providing a summary of the key challenges that need to be addressed regarding the skills and skills needs of the labour force in England. These challenges have sectoral, regional as well as local dimensions. This chapter also describes the gaps that exist in the knowledge and understanding of skills and skills needs, and suggests some areas where future research efforts can be usefully made.

Volume 2 describes the detailed local and sectoral literature.

1.88 Volume 2 of the *Skills in England 2002* describes in detail the existing sectoral levels. This is the first time that such a comprehensive bibliography of the wide ranging research and evidence has been completed in a single review, enabling the similarities and differences between local areas and between sectors to be identified and evaluated.

Chapter 2: International Evidence on Skills



Chapter 2

International Evidence on Skills

Overview and Summary

2.1 This chapter briefly describes the international evidence on skills and examines the evidence on the links between skills and economic performance. This is important both to set the wider context for discussing the role of skills, but also to highlight how this country performs in terms of a number of key indicators.

This chapter examines the international evidence on skills.

2.2 Differences in basic skills such as literacy and numeracy, in educational participation and qualifications, and in workplace training, all contribute to the large differences in the skills, knowledge and competencies that exist between workers in different countries.

2.3 Differences in skills between countries have been shown to have important implications. Considerable evidence now exists which demonstrates that differences in education, in skills, broadly defined, and in training provision can all contribute to international differences in individuals' earnings and employment probabilities, in firms' productivity and profitability, and in aggregate economic performance.

Differences in skills contribute to differences in earnings, productivity and economic growth between countries.

2.4 In this chapter, differences in workers' skills between countries are documented and their implications for individuals, for firms and for the wider economy are briefly examined. The evidence demonstrates that basic skills and education differ considerably between countries, as does training provision and participation.

There are large differences in skills between countries...

2.5 However, it is difficult to make generalisations. For example, UK graduates – both men and women - earn the highest net rates of return to their degrees of any comparable country, including the US, once the costs and duration of study have been taken into account (Blöndal, 2002). This is despite the fact that the UK already has one of the highest proportions of its workforce with degree-level education, and one of the highest participation rates at the tertiary level. At the other end of the skills scale, the UK's record in terms of basic numeracy and literacy, as well as in certificated lower-level qualifications, is amongst the weakest in Europe. The UK also has an extremely poor record on vocational qualifications.

and Britain has some of the best and worst in terms of provision, participation and outcomes in both education...

2.6 In terms of training, the UK has one of the highest levels of workers participating in training, but the duration of this training is shorter than in almost any other comparable country, and results in fewer formal certificated qualifications than in other OECD countries (OECD, 1998).

and training.

2.7 While international comparisons must be made with care, some commentators (such as Layard *et al*. 2002) have suggested that certain skills deficiencies, particularly basic literacy and numeracy, and intermediate vocational and technical skills, may account for the UK's comparatively low productivity compared with its competitors.

There is evidence that skill deficiencies may account for the UK's poor comparative performance.

Introduction: International Comparisons of Skills

International differences in basic skills, in education and in training are all described in this chapter.

2.8 This chapter documents the major findings on international comparisons of skills. A number of dimensions of skills are examined. First, internationally comparative evidence on basic skills, particularly numeracy and literacy, is described. Second, differences in educational provision, participation and attainment are examined. Third, comparable rates of return to schooling and qualifications are presented. Finally, details of on-the-job and off-the-job training provision and attainment are discussed.

International comparisons are difficult but...

2.9 One important caveat to all of the evidence presented in this chapter is that international comparisons of skills are extremely difficult. For example, even the use of standardised literacy and numeracy tests to measure skills in different countries has been problematic due to inconsistencies in translating some questions into certain languages, leading to less confidence in the comparative statistics that result (Blum and Guerin-Pace, 2000). Thus, caution should be used in the interpretation of differences between countries, especially where these differences are small.

the consensus is that the UK's record on skills at all levels (with the exception of the very highest level) is poor.

2.10 However, there is a consensus that emerges from all of the evidence. In comparison to other OECD countries, especially those elsewhere in Europe, the UK has:

- a high proportion in the adult population with low levels of literacy and numeracy;
- a shortage of intermediate level, especially vocational, skills;
- a relatively high proportion of workers with higher level, especially non-vocational, skills.

In this sense, there is a polarisation of skills in the UK that is not as apparent in other countries, with the exception perhaps of the US. Training provision and participation then serves to exacerbate the existing skills differentials between individuals.

The implications for earnings and economic performance are examined...

2.11 Following this description of skills and knowledge differentials between countries, the chapter then briefly examines the evidence on the implications of the differences in skills that are identified. Individuals' earnings and employment prospects, as well as corporate productivity and aggregate economic performance are all seen to be impacted upon by differences in skills. There may also be wider social consequences of low-skills, including social exclusion.

and recent initiatives which target skills demand as well as supply are outlined.

2.12 A number of current policy initiatives are addressing the UK's poor historic provision of skills. While much of the effort has focused on improving the supply of skills, more recent endeavours have started to address employers' demands for skills which have also been found to be weak by international standards.

Basic Skills: Literacy and Numeracy

Literacy and numeracy skills are important for employment.

2.13 At the most basic level, some degree of literacy and numeracy is required for almost all forms of employment in the advanced economies. The most comprehensive internationally-comparative evidence on basic skills can be obtained from the International Adult Literacy Survey (IALS) (OECD and Statistics Canada, 1995; OECD *et al*. 1997, OECD, 2000). Data for the youngest cohorts' scientific and mathematical skills are available from the TIMSS (IES, 1996).

Britain has low levels of literacy and numeracy among the adult population compared to other advanced economies.

2.14 The Moser report (Moser, 1999) estimated that around 7 million adults in the UK (approximately 20%) are functionally illiterate, while around twice that number have very poor numeracy skills. The IALS data confirms this impression of low levels of basic skills amongst the adult population in Britain. This reveals that while all countries have a proportion of their workforce with low levels of literacy and numeracy, Britain has the highest proportion of working age population with the lowest levels of literacy and numeracy of all the counties in the study, with the exception of Ireland and Poland (OECD, 2000).

Partly this is a historic problem...

2.15 Undoubtedly, part of this low literacy and numeracy is a function of the legacy of low enrolment rates in post-compulsory education for previous generations, and can be expected to be naturally corrected over time as the more recent - and continuing - growth in participation in higher education feeds through into the working population.

but even among young people still in education, scientific and mathematical skills are weak.

2.16 However, in part this optimism may be misplaced since the TIMSS suggests that younger cohorts in the UK, while more educated than their parents, are still falling behind their overseas contemporaries. Furthermore, there is still a large proportion of the adult population with low skills.

Education and Training Participation and Attainment

Education

2.17 The OECD has adopted the International Standard Classification of Education (ISCED) system to facilitate comparisons of educational attainment between countries. ISCED was originally designed by UNESCO in the early 1970s to serve 'as an instrument suitable for assembling, compiling and presenting statistics of education both within individual countries and internationally'. The ISCED typology is described in further detail in *Annex A, Table A2*. This classification system forms the basis for much of the comparative evidence emanating from the OECD on education systems (for example, OECD, 2001; Steedman and McIntosh, 2001).

International comparisons of education are based on years of schooling, and/or the highest educational level achieved. Britain is ranked highly within OECD countries on both measures.

2.18 A comparison between OECD countries of educational attainment is provided in *Table 2.1* and *Figures 2.1* and *2.2*. Two measures are provided – the proportions of the working age population whose highest attainment level is upper-secondary or tertiary (primary level attainment is now almost universal in the OECD) and the average number of years of schooling. As can be seen, the UK performs relatively well in terms of the proportion reaching at least upper secondary level, while there are only relatively small differences between countries in terms of average years of schooling across the OECD.

Table 2.1 Educational Attainment of the Adult Population

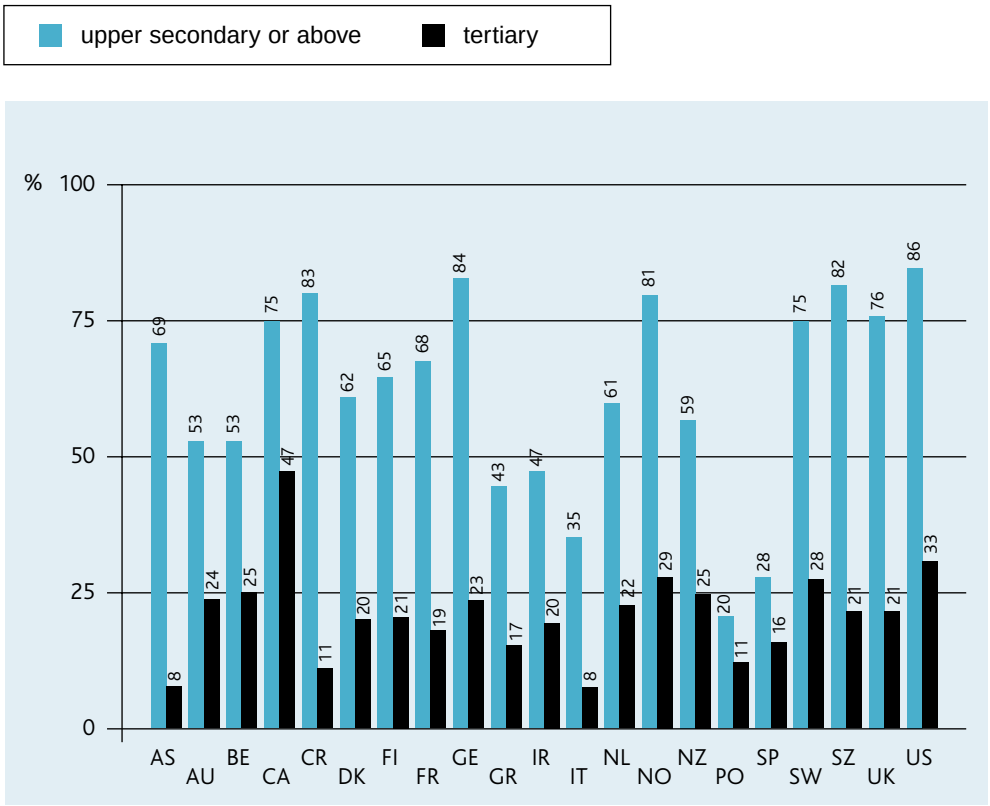
Percentage of the population aged 25-64 by the highest completed level of education and estimated average number of years of schooling, 1995

	Highest completed level of education		
	Upper secondary or above (%)	Tertiary (%)	Average years or schooling
Australia	53	24	11.9
Austria	69	8	11.9
Belgium	53	25	11.7
Canada	75	47	13.2
Czech Republic	83	11	12.4
Denmark	62	20	12.4
Finland	65	21	11.6
France	68	19	11.2
Germany	84	23	13.4
Greece	43	17	10.9
Ireland	47	20	10.8
Italy	35	8	10.0
Netherlands	61	22	12.7
New Zealand	59	25	11.4
Norway	81	29	12.4
Portugal	20	11	10.0
Spain	28	16	11.2
Sweden	75	28	12.1
Switzerland	82	21	12.6
United Kingdom	76	21	12.1
United States	86	33	13.5
OECD average	62	21	11.9

Source: *Education at a Glance – OECD Indicators (OECD, 1997b), indicator A2.1, p. 38 (using data on educational attainment of individuals from Labour Force Survey sources, or in the case of Denmark, The Register of Educational Attainment of the Population).*

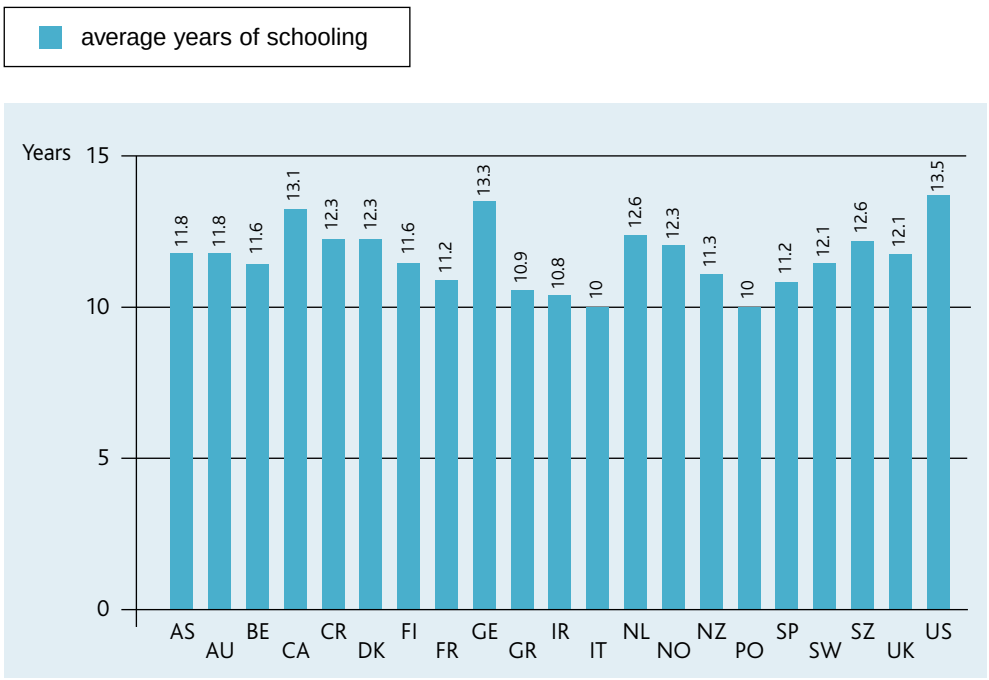
Notes: *The estimates of average years of schooling relate to total cumulative duration of time spent in formal education over all ISCED levels from the beginning of primary level (ISCED 1) to tertiary level. These estimates are obtained by using data on educational attainment of each age group from the Labour Force Survey and applying an estimated average cumulative duration for each level of education. Where there are programmes of different duration at the same ISCED level, a weighted average is taken based on weights corresponding to the number of persons in each broad educational programme.*

Figure 2.1 Highest Educational Attainment of the Adult Population
(percentage achieving level)



Source: *OECD (1998).*

Figure 2.2 Average Years of Schooling



Source: *OECD (1998).*

2.19 Recent work by Barro and Lee (1993, 1996, 2001) has also focused on comparisons of educational attainment between countries. However, given the wider set of countries they consider – including many developing and transition countries – and the paucity of detailed data (such as household surveys), especially for their historical series, they simply focus on average years of schooling and a broad measure of education level attained. *Table 2.2* and *Figure 2.3* and *2.4* provide some details for a range of country groups.

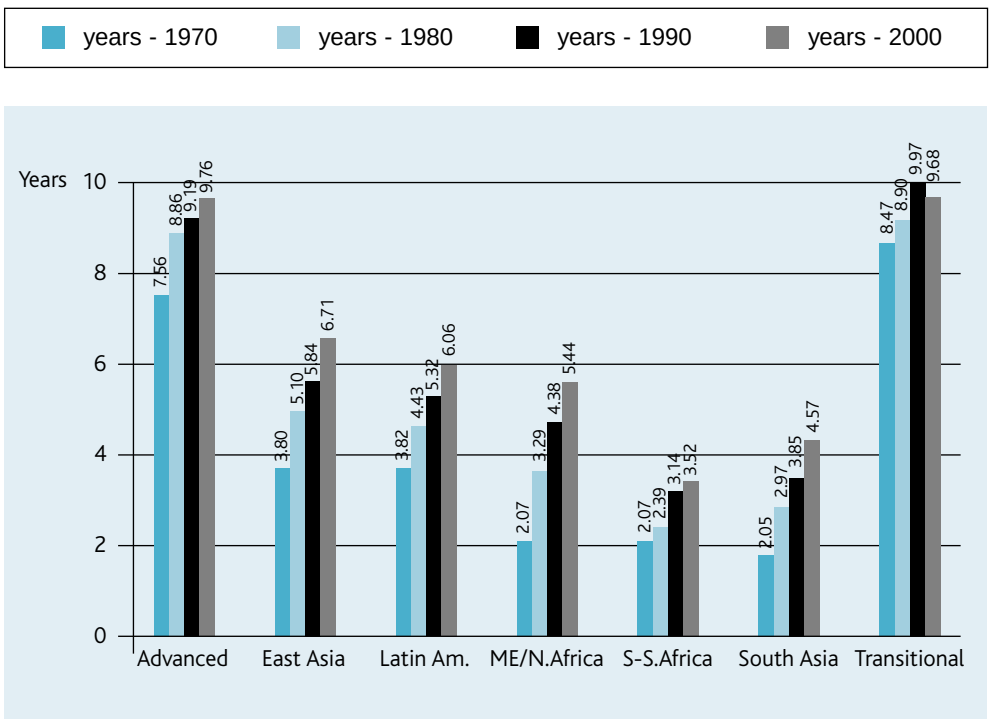
Table 2.2 Average Schooling and No Schooling Rates 1970-2000 by Region

Population aged 15 and over

	Mean school years				% with no education (age 15+)			
	1970	1980	1990	2000	1970	1980	1990	2000
Middle East/North Africa	2.07	3.29	4.38	5.44	69.8	55.5	42.8	32.0
South Asia	2.05	2.97	3.85	4.57	69.3	66.9	55.2	45.2
Sub-Saharan Africa	2.07	2.39	3.14	3.52	63.8	56.8	45.9	42.8
East Asia and Pacific	3.80	5.10	5.84	6.71	35.4	22.6	26.4	19.8
Latin American and Caribbean	3.82	4.43	5.32	6.06	31.2	23.8	17.2	14.6
Advanced Countries	7.56	8.86	9.19	9.76	5.1	4.8	4.5	3.7
Transitional	8.47	8.90	9.97	9.68	3.1	2.8	1.7	2.2
World	5.16	5.92	6.43	6.66	31.4	29.5	26.4	24.2

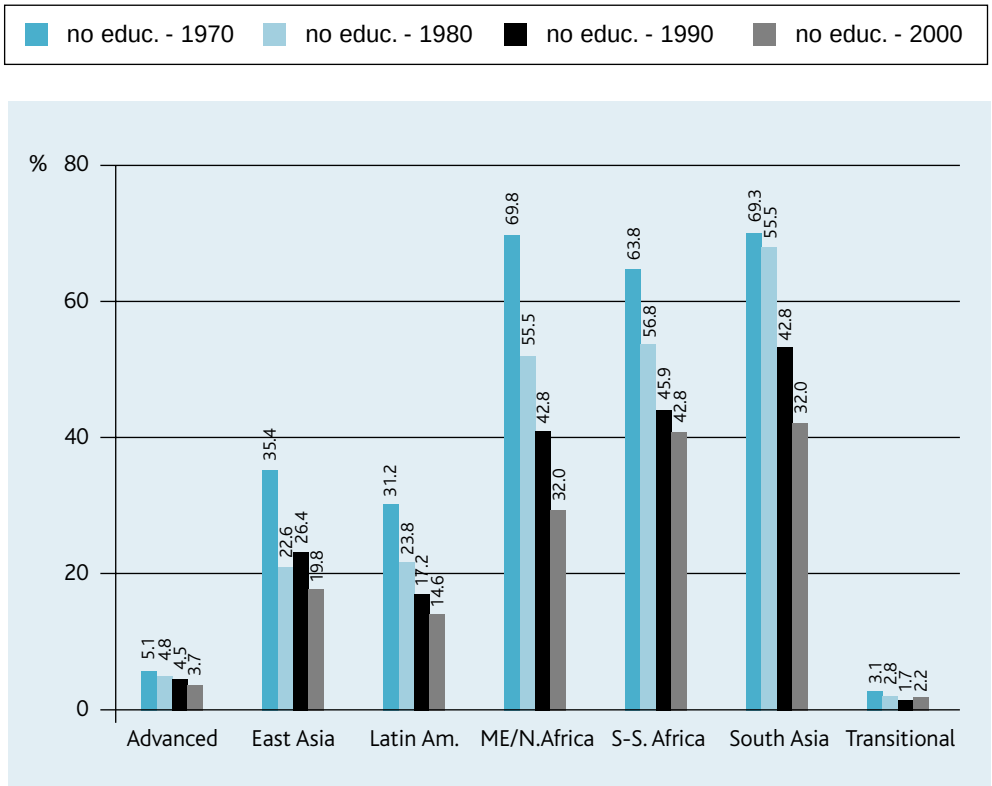
Source: *Barro and Lee (2001).*

Figure 2.3 Schooling Attainment 1970-2000: Average years of Schooling



Source: *Barro and Lee (2001).*

Figure 2.4 Schooling Attainment 1970-2000: Percentage of Population 15+ with No Schooling



Source: *Barro and Lee (2001).*

World-wide, education levels are increasing.

2.20 In general, there have been increasing average levels of education participation over the last three decades, in all regions, but growth has been particularly strong in the Middle East and North Africa. Mean school years have increased in developed countries too, with the net result that there has been a substantial increase in the world stock of educated people, although little convergence between regions. South Asia and Sub-Saharan Africa still have substantial proportions of their populations with very little or no education.

Outcomes can be measured in terms of earnings, or as the rate of return on the investment in an extra year of education.

2.21 The outcomes of differences in education attainment can be measured in a number of ways. Most common are estimates of the private returns to education, usually measured as the rate of return (additional earnings) to an extra year of education or training having taken account of the other factors that may influence earnings such as experience, gender etc. Such estimates typically fail to take into account the direct and indirect costs and benefits of education, including tuition fees, grants and loans, subsidies and foregone earnings. As an alternative, some studies compute the internal rate of return, which is the discount rate that equalises the real direct and indirect costs of education to the subsequent gains. These studies take better account of the costs of education, but do not take into account the other factors which affect earnings.

Several recent studies have surveyed the internationally comparative literature.

2.22 There have been a number of recent studies which estimate and/or compare returns to education in different countries. These include:

- Psacharopoulos (1994) who presents a summary review of a great many individual country studies;
- Trostel *et al*. (2002) who provide estimates of the private returns to schooling for 28 countries from a consistent dataset for all countries;
- Harmon *et al*. (2001) which comprises a set of studies for different individual European countries;
- Ashenfelter *et al*. (1999) who compare and contrast the estimates of the returns to schooling obtained using different methodologies;
- Harmon *et al*. (in press) and Card (2001) who discuss some of the deficiencies in the literature and their implications for estimates of the rates of returns; and
- Blöndal *et al*. (2002) who examine the incentives for young people to stay in post-compulsory education.

Education is a beneficial investment for the individual ...

2.23 The central conclusion from all these studies is that, while the returns differ between countries, and also between individuals within countries, investment in education earns a substantial premium over and above any comparable financial investment or investment in physical capital. Average rates of return are approximately 10% worldwide.

in developed and developing countries, for men and especially for women.

2.24 Psacharoupoulos (1994) has the widest geographic coverage of any of the reviews and surveys the widest range and greatest number of studies. He concludes that:

- returns are higher for developing than for developed countries;
- returns are higher for primary and secondary education in developing countries, but higher for tertiary education for developed countries;
- rates of return decline by level of schooling, and by the country's per capita income; and
- investment in women's education is generally more profitable than investment in men's.

Average returns in developed countries appear to be about 5% for men and 6% for women...

2.25 Trostel *et al*. (2002) utilise the International Social Survey Programme (ISSP) data – which comprises a common questionnaire used to survey individuals in 28 countries over the period 1985-95. Their estimates are therefore comparable between countries. The countries are primarily OECD and Eastern European. The basic estimates for the average rate of return are 4.8% for men and 5.7% for women.

2.26 However, there is considerable variation in the estimated returns as shown in *Table 2.3*, which vary from 1.9% for women in the Netherlands to 19.2% for women in the Philippines. It is difficult to explain much of this variation – Trostel *et al*. (2002) show that it appears to be unrelated to expenditure on

education, or to per capita income, or average attainment. They also find that returns also appear to be fairly constant over time – there is no evidence of a fall in the returns to education as the numbers with qualifications have risen, nor does the evidence support increasing returns to education in a more technologically advanced age as suggested by Blackburn and Neumark (1993) and Murnane *et al*. (1995) for the US.

Table 2.3 Cross-Country Estimates of the Rate of Return to Schooling

	Rate of return:	
Country:	**Male (%)**	**Female (%)**
Australia	5.1	5.2
Austria	3.8	6.4
Bulgaria	4.0	5.7
Canada	3.8	4.5
Czechoslovakia	3.1	3.6
Czech Rep.	3.5	4.3
East Germany	2.6	4.5
Great Britain	12.7	13.0
Hungary	7.5	7.7
Italy	3.7	5.3
Ireland	8.5	9.0
Israel	5.3	6.1
Japan	7.5	9.4
Latvia	6.7	7.8
Netherlands	3.1	1.9
New Zealand	3.3	2.9
Northern Ireland	17.4	14.6
Norway	2.3	2.5
Philippines	11.3	19.2
Poland	7.3	10.0
Russia	4.4	5.3
Slovak Rep.	5.2	6.4
Slovenia	8.0	10.1
Spain	4.6	3.8
Sweden	2.4	3.3
Switzerland	4.5	4.8
USA	7.4	9.6
West Germany	3.6	4.3
Aggregate	4.8	5.7

Source: *Trostell et al. (2002).*

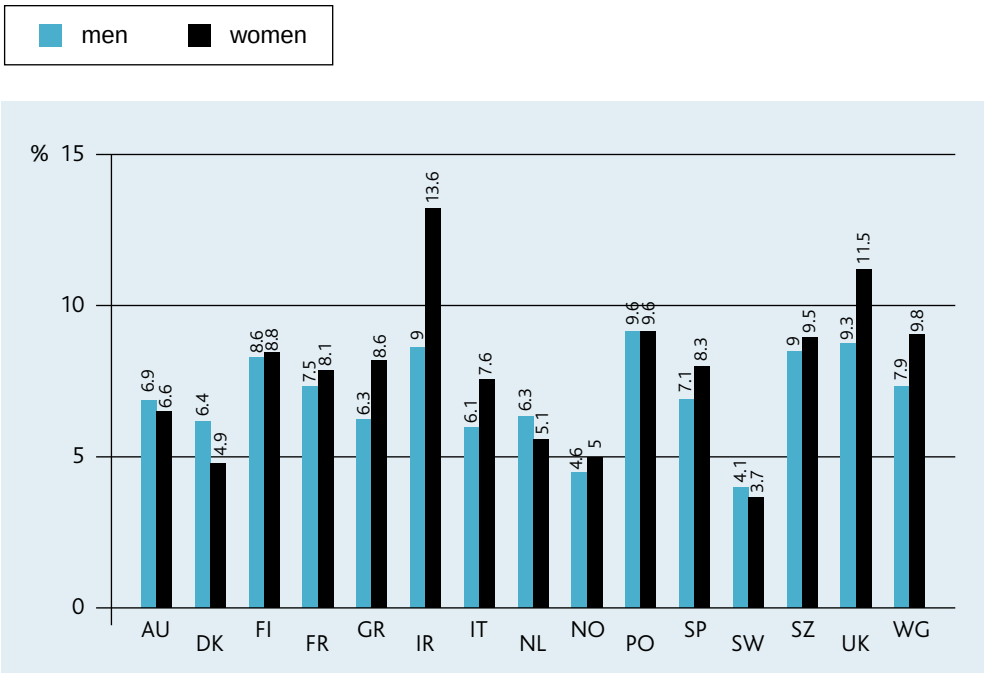
Notes: *The estimating equations include year dummies, union status, marital status, age and age squared and, in the case of the aggregate equation, country-year dummies.*

Notes: *Estimates based on national pooled cross-section survey data for up to 11 years from 1985 to 1995.*

but returns in Britain appear to be rather higher, at around 8% for men and 10% for women.

2.27 On the basis of this comparable data, the rates of return to additional years of education in Britain at 12.7% for men and 13.0% for women are amongst the very highest. Part of this excess return may be due to particular measurement issues present for Britain (and Northern Ireland) namely that the schooling measure is truncated at 10-14 years, and those with more than this level schooling would be expected to earn more, thus biasing the estimated rate of return upwards. A more common consensus on the rates of return to schooling in the UK would be between 7% and 9% for men, and between 9% and 11% for women (Harmon *et al.* in press), still considerably above the average rate of return for comparable developed countries as shown in *Figure 2.5*.

Figure 2.5 Rates of Return to Schooling in Europe for Men and Women
((%) returns to schooling for year closest to 1995)



Source: *Harmon et al. (2001).*

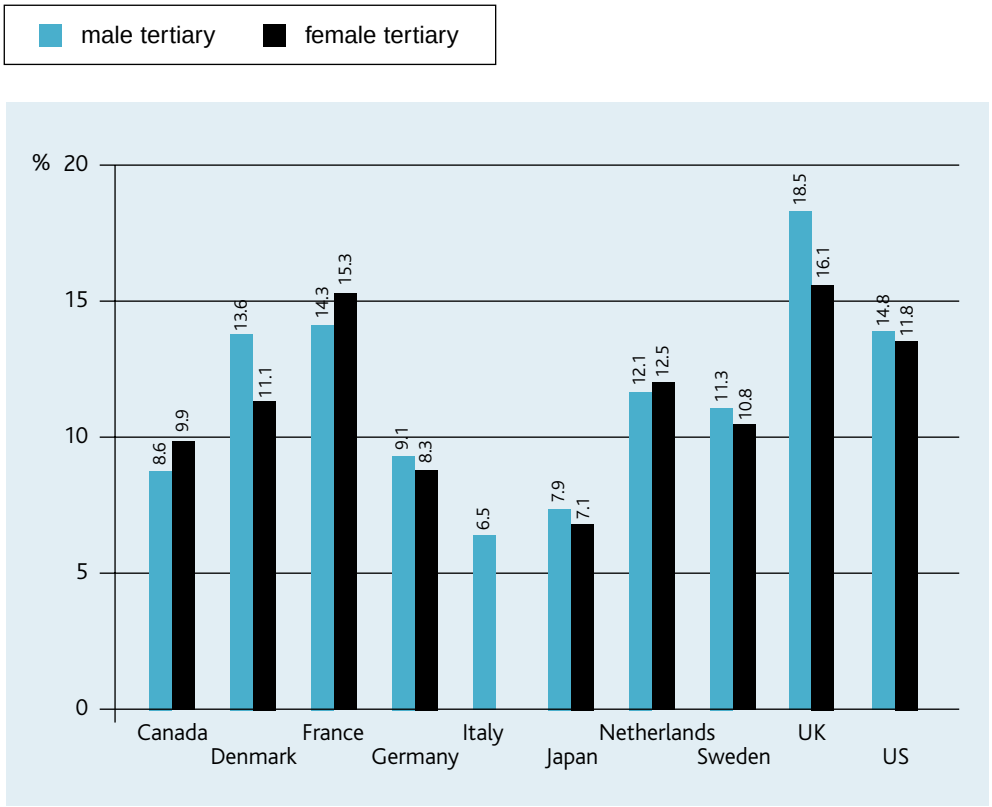
Returns to a degree in Britain are amongst the very highest in the advanced world...

2.28 Further evidence on high rates of returns to education in the UK has been provided most recently by Blöndal *et al*. (2002). They show that the net internal rates of return to tertiary level education (i.e. taking into account student loans and grants, public subsidies, length of study period and the tax system) is higher in the UK for both men and women than in all the other countries surveyed. The relative rates are shown in *Figure 2.6. A* similar picture is apparent for upper-secondary level education as shown in *Figure 2.7*, with the UK having the highest internal rate of return for men, next to the US, although for women, comparable data are not available.

2.29 These estimates for the UK are not out of line with the rates of return presented in the Dearing report (Dearing, 1997). Since these are much higher than commercial rates of interest, higher education represents a very good investment. Indeed the private returns are so much greater than the social returns that we may get over-investment in education (from society's point of view). Over-investment occurs because individuals only pay part of the true cost of their education (Chevalier, 2000; Green *et al*. 1999).

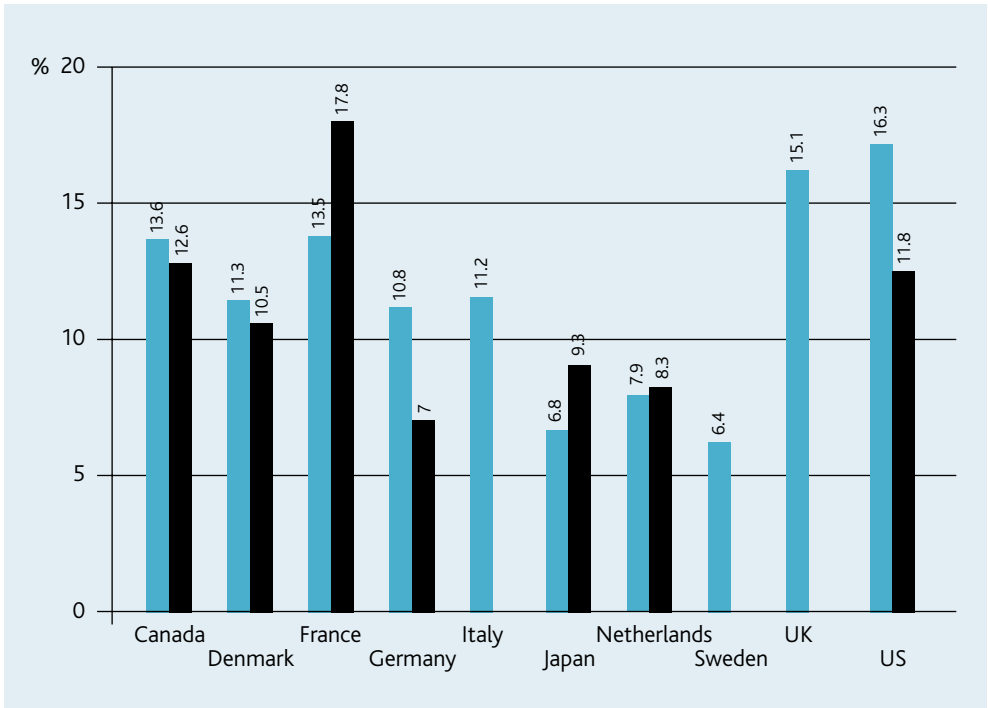
and thus university education appears to be a profitable private investment.

Figure 2.6 Private Internal Rates of Return to Tertiary Education: 1999-2000



Source: *Blöndal et al. (2002).*

Figure 2.7 Private Internal Rates of Return to Upper-secondary Education: 1999-2000



Source: *Blöndal et al. (2002).*

2.30 Social rates of return are typically less than private rates of return since governments usually subsidise some proportion of individual's costs of education through the tax system. In the late 1990s, it was estimated that the social returns for graduates in the UK were 7-9%. Dearing concluded therefore that society should raise its level of investment in higher education, since this rate of return is still greater than market rates.

Social rates of return are also relatively high in Britain.

2.31 More recent estimates of the social rate of return for different countries are provided by Blöndal *et al*. (2002). These reveal that the social as well as the private rates of return for the UK are comparatively high. On that basis, there is an economic argument for continued investment in education by the state as well as by private individuals in the UK.

Training

Training in Britain is more frequent and of shorter duration than in competitor nations.

2.32 The UK is well placed internationally in terms of its training provision in that the proportion of workers receiving some form of training is relatively high. However, training durations are short, and dominated by on-the-job-training, with a relatively high proportion concerned with induction procedures, and health & safety issues, rather than being directly productivity-enhancing. Training is also concentrated on those with high levels of education - as in other countries - therefore serving to exacerbate skills inequalities.

2.33 It is difficult to interpret the degree of training differences between countries. One rationale is that workers in the UK require lots of training because they are relatively low-skilled. The opposing argument is that frequent short periods of training provide a continuous upgrading of skills to meet the latest workplace requirements. Distinguishing between these two arguments is difficult, but evidence on the relatively productivity of workers suggests that, despite the greater frequency of training in the UK, employees are less productive than those in the major European competitor nations, or the US. This divergence has led some to question the quality of the training delivered in Britain.

Despite the higher levels of training, workers in the UK are still less productive than in other major European countries or the US.

Implications of International Skill Differentials

2.34 International differences in skills may be expected to have an impact on individual earnings, on organisational performance, on productivity and profitability, and on aggregate economic growth.

2.35 There is a growing body of international research focussing on the relationship between skills and economic performance at the level of the individual organisation. Links between investment in various forms of human capital and improved organisational performance are complex and typically involve a combination of a range of human resource management policies and practices, including investment in training in skills. While the latter is not a panacea, it is an essential element in any broad strategy to improve the performance of the organisation. This research is reviewed in Briscoe and Wilson (2002).

2.36 It is difficult to measure the link between skills and labour productivity, in part because of the difficulty of measurement of both factors. However, a sequence of studies by the National Institute for Economic and Social Research (for example, Mason *et al*. 1994; Prais *et al*. 1989) has used matched comparisons of UK and continental manufacturing firms in a range of industries to examine this issue. The evidence suggests that the higher productivity in continental firms is indeed associated with the greater skills and knowledge of their workforces.

The evidence suggests that higher skills are linked with higher productivity.

2.37 In the 'new growth' literature, education is used to explain the self-perpetuating, or endogenous growth of economies. There are two main strands to the literature. First, higher levels of education imply higher GDP, since more educated individuals are more productive. Thus growth in the stock of education leads to growth in GDP. Second, more education implies greater innovation, greater flexibility to produce and adapt to technical change, which leads to greater growth. So a higher initial level of education also leads to higher growth in GDP. A brief, non-technical review of the new growth theories is presented in Temple (2002), while Aghion and Howitt (1998) provide a much more comprehensive review of the academic literature.

Education, innovation and economic growth are also related …

2.38 Griliches (1997, reported in Blundell *et al*. 1999) presents evidence to suggest that changing education levels over the last 50 years can explain approximately one third of US productivity growth over the period.

A comparable estimate by Jenkins (1995) reveals that, for the UK, a 1% increase in the proportion of labour force with higher qualifications raises annual output by 0.42-0.63%.

With tertiary level education particularly important for developed countries like the UK.

2.39 More generally, others (e.g. Gemmel, 1996; Mankiw *et al*. 1992) have shown that the higher growth in education in the 1960s is associated with higher economic growth. Growth in primary and secondary education is more important for developing countries, but in developed countries (where saturation at these levels has already been achieved) growth in tertiary level education is more important. There is also evidence to suggest that growth is higher when the initial level of education (or 'stock of human capital') is higher as suggested by the second strand of literature described above.

2.40 Finally, there is some evidence which supports the wide social benefits of a more educated society. These externalities include:

- increased democratic participation;
- greater social cohesion/inclusion; and
- lower crime.

Table 2.4 Private Internal Rates of Return to Education, 1999-2000

	Tertiary education		Upper-secondary education	
	Men	Women	Men	Women
Canada	8.7	9.9	13.6	21.7
Denmark	13.7	11.1	11.3	10.5
France	14.3	15.4	13.5	17.9
Germany	9.1	8.4	10.8	7.0
Italy[1998]	6.5	..	11.2	..
Japan	7.9	7.2	6.8	9.4
Netherlands[1997]	12.1	12.5	7.9	8.4
Sweden	11.4	10.8	6.4	..
UK	18.5	16.1	15.1	..
US	14.9	14.7	16.4	11.8
Average	11.7	11.8	11.3	11.1

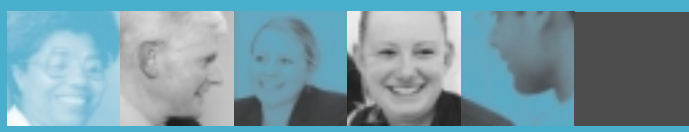
Source: *Blöndal et al. (2002).*

Notes:

1. The rates of return to tertiary education are calculated by comparing the benefits and costs with those of upper-secondary education. In the case of rates of return to upper secondary education, the calculation compares the benefits and costs with those of lower-secondary education. In Sweden, the theoretical length of standard tertiary courses is used in the calculations rather than the average theoretical length of different programmes. Moreover, earnings differentials for women between upper and lower-secondary levels are not large enough to permit a positive rate-of-return calculation. In the United Kingdom, data on earnings of women up to age 30 with lower-secondary education were not available. In Italy, reliable data on earnings for women were not available.

2. .. denotes not available.

Chapter 3: The Demand for Skills



Chapter 3

The Demand for Skills

Overview and Summary

Strong employment growth has increased the demand for skills.

3.1 This chapter reviews recent evidence relating to the demand for skills by employers. It highlights the steady growth in employment in the 1990s and the effect that this has had on the demand for skills. Within this scenario of rapidly growing job numbers, there have been significant shifts in the fortunes of particular sectors. These have had important implications for the occupational structure of employment and the kinds of skills required, including a dramatic increase in the average level of formal qualifications held by the workforce. While many of these trends have been common across the country, the historical sectoral specialisation of many regions and localities has meant that some regions have fared much better than others.

Sectoral and other structural changes have changed the patterns of employment...

3.2 Long-standing trends in the sectoral structure of employment have continued into the late 1990s, albeit on a less dramatic scale. This has resulted in substantial growth in the number and proportion of people employed in the financial and business services sector, distribution hotels and catering services and mainly non-marketed services such as education and health. In contrast, the manufacturing and primary sectors have witnessed a continued decline in employment.

in favour of high level non manual occupations and at the expense of traditional manual jobs.

3.3 These changes have contributed to significant changes in the occupational structure of employment. This has involved a continued rapid growth in the absolute number of, and relative importance of, managerial, professional and associate professional occupations. Personal service and sales occupations have also grown, but to a lesser extent. Employment in skilled trades, operatives and elementary occupations has fallen.

3.4 Sectoral trends have been reinforced by the changing occupational structure of employment within most sectors. In particular, the proportion of managerial and professional staff employed has increased across most sectors, including manufacturing.

The average level of formal qualifications held has also risen sharply.

3.5 The average level of formal qualifications held by employed people has increased markedly over the 1990s. This provides one important piece of evidence about an overall increase in the demand for skills throughout the economy, although it is important to note that there have been some voices of concern about over-qualification in some areas.

These broad patterns are common across all regions but there are significant regional differences, often linked to the underlying economic structure.

3.6 These patterns of changes in skill requirements, as measured by changes in occupations and qualifications are repeated in broad terms across most regions though the pace and extent of change varies very considerably. This reflects existing patterns of specialisation by sector. There has been particularly strong growth in managerial, professional and associate professional/technical jobs in London and the South East. These regions have seen an increase in demand across most occupational groups, while the more northern regions have seen modest increases in managerial, professional and service employment, but significant falls in the demand for operatives and craft workers.

Skill requirements within occupations are also increasing...

3.7 Occupations and qualifications provide only a partial picture of changing skill needs. Employers set great store on other aspects including key and generic skills. The increasing importance of such skills is explored, based on the most recent Skills Surveys and other evidence.

with higher qualifications, greater generic skill needs and longer training times are needed.

3.8 Detailed investigations of the skills needed to undertake most jobs suggest a general increase in skill requirements. Most jobs need more training, more learning time as well as high formal qualifications. Higher levels of technical and (particularly) generic and IT skills are also required.

Government has placed greater emphasis on sectoral involvement in assessing skill needs...

3.9 Recent changes in government policy have placed an increasing emphasis on involving employers in the assessment of changing skill needs in their sectors. A detailed review of the evidence about developments in a range of sectors, based on the research carried out by or on behalf of various sectoral organisations has been conducted. This highlights that, while there are issues that are specific to each sector, the broad trends identified are common to all sectors. Full details of the sectoral review can be found in Volume 2 of this *Skills in England 2002*.

which has highlighted some of the detailed underlying causes of changing skill needs.

3.10 The sectoral review also provides much more insight into the key drivers of changing skill requirements. These include:

- **technological change,** especially information and communications technology (ICT), which is affecting both the products and services produced as well as the way they are produced, resulting in increased demands for IT skills;
- **competition** and changing patterns of consumer demand, which has increased the emphasis on customer handling skills;
- **structural changes,** including globalisation, sub-contracting and extension of supply chains, emphasising the need for high quality managerial skills at various levels;
- **working practices,** such as the introduction of team-or cell-based production in engineering, and call centres in financial services, resulting in increased demand for communication and team working skills; and
- **regulatory changes,** as well as increased concern about environmental issues, which have made important skill demands upon staff for some key sectors, including construction and finance.

Local bodies have also been charged with assessing needs in their own areas.

3.11 Local and regional bodies have also been charged with helping to identify, prioritise and meet skill needs in their areas. In order to meet these aims a large amount of research has been conducted, resulting in a growing body of evidence. While much of this simply serves to reinforce and confirm the results from national studies, there are also important insights into the specific problems facing certain localities as well as possible responses to meet these difficulties. Full details of the review at the local and regional level can be found in Volume 2 of the *Skills in England 2002*.

3.12 These local and regional studies tend to show a common emphasis on:

Basic skills, intermediate skills, generic skills, IT skills and management skills are highlighted as priority areas.

- **basic skills:** the great majority of jobs now require at least basic levels of literacy and/or numeracy;
- **intermediate skills:** skills that are above the routine level, but below professional skills;
- **generic skills:** such as problem solving, communication and team working;
- **IT skills:** ranging from basic keyboard skills to advanced programming; and
- **management skills:** not just amongst those in managerial occupations, including leadership skills, entrepreneurship, cultural awareness and adaptability to change.

Overall Trends in Employment and the Demand for Skills

3.13 The demand for skills is driven by the demand for goods and services which people are employed to provide. In assessing the demand for skills it is important, therefore, to consider the various influences on the changing pattern of demand for goods and services.

The demand for skills is derived from the demand for goods and services.

3.14 During the 1990s total employment has continued to grow substantially. Much of this growth has occurred in the South of England. In total, employment increased by over 1.6 million between 1991 and 2001, of which over half a million was in London and almost 0.4 million in the rest of the South East. In part, the overall increase reflects the recovery from the recession of the early 1990's but, even so, it represents an exceptional period of growth for many parts of the country.

Total demand has risen sharply as the economy has grown.

3.15 Total employment levels are now at an all-time high. (In part, the recent growth can be explained by improved measurement techniques. The introduction of the new Annual Business Inquiry (ABI) resulted in an upward revision of employment estimates of almost three-quarters of a million jobs in 2000.) In contrast, unemployment levels are lower than at any time since 1973. Much of the employment increase has been for part-time jobs. Nevertheless, such large increases clearly represent a significant growth in the demand for labour and hence for skills over this period.

Employment levels are now at an all-time high, although most of the growth has been in part-time employment.

3.16 As noted in Chapter 1, there are a number of ways in which the demand for skills by employers can be measured. These include changing patterns of occupational employment, and an assessment of the qualifications and key and generic skills needed to undertake jobs by both employers and employees. Although the focus here is on the demand for skills, it is important to bear in mind that, in each case, the available data represent the outcome of the interaction of both supply and demand factors.

Skill requirements can be measured in various ways.

3.17 The ways in which the growth in employment breaks down across various different dimensions such as sector and occupation can help to explain which types of skills are in demand as well as those for which demand is declining. The next section begins by examining changes affecting the main economic

Trends in occupational employment provide a key indicator...

sectors in which people are employed. Employment trends by occupational group are considered next. This includes a discussion of changes in occupational structure within sectors.

but changes in qualifications and key and generic skills are also important.

3.18 While occupational trends provide some useful insights into the changing demand for skills, this is only a partial picture. It is important also to consider the types of skills and qualifications required in order to perform a job effectively. As with occupational employment structure, these are changing for a number of reasons. These include the introduction of new technologies, changes in work organisation, regulatory requirements and changes in customer demand.

The chapter includes detailed reviews of sectoral and local evidence.

3.19 A considerable amount of information on trends in the types and levels of skills required in employment has been assembled in recent years. New survey evidence and other detailed research are examined to identify the key messages. The chapter concludes with an assessment of the enormous range of detailed research which has been conducted at sectoral and local level over the last few years.

Sectoral trends

The UK has seen substantial structural change in employment in recent years...

3.20 In common with most other developed economies, the UK has seen dramatic changes in the sectoral structure of employment over the last few decades. *Table 3.1* and *Figures 3.1* and *3.2* summarise the key features, focusing on England. *Figure 3.3* provides a more detailed analysis, focusing on the 22 sectors used to categorise sectoral change in Volume 2 of the *Skills in England 2002*.

reflecting a variety of influences including technological change and globalisation.

3.21 These changes have reflected the influence of a number of inter-related factors including technological change, changes in the patterns of world trade (including globalisation), increasing specialisation and changing patterns of demand for goods and services.

Many traditional areas of employment have disappeared...

3.22 Many traditional areas of employment have witnessed dramatic job losses. This has had a direct impact on the demand for many skills. Large falls in employment have taken place in the primary sector. Agriculture and mining have borne the brunt of these changes although, more recently, the utilities have also seen sharp job losses, especially following privatisation. In manufacturing, a combination of pressures of international competition and the continuing process of specialisation and sub-contacting has resulted in severe contraction for many parts of the sector.

but these job losses have been more than offset by increases elsewhere...

3.23 These job losses have been more than offset by growth in other areas. A significant part of the growth has reflected the obverse of the process of specialisation in manufacturing. Many functions previously undertaken within manufacturing companies are now done by specialist service companies. These functions including research, design and development, as well as finance, marketing, cleaning, security and catering. Rising real incomes have also resulted in people spending more of their income on leisure and entertainment, as well as on health care and education. This has all been facilitated by technological developments, especially in the areas of information technology, communications and transport, which have resulted in many new products and services, as well as revolutionising many processes.

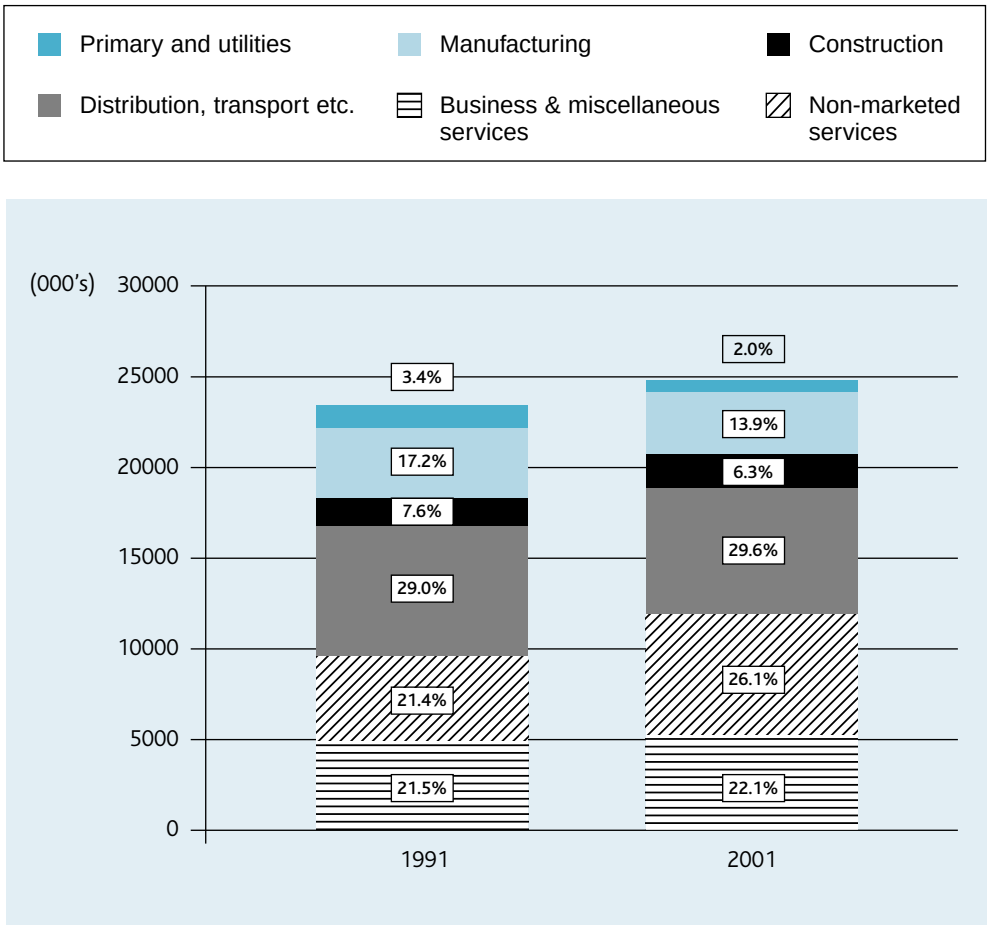
with large job increases in many parts of the service sector.

3.24 As a consequence of these various factors, the sectoral pattern of jobs growth has seen large increases in employment for business services, distribution and transport and non-market services, including health and education. *Figure 3.4* provides the details. This clearly illustrates the increasing importance of business services as a growth area during the 1990s as well as the deceleration in the rate of job loss in most primary and manufacturing industries.

These basic patterns have been repeated across all regions but some have fared much better than others.

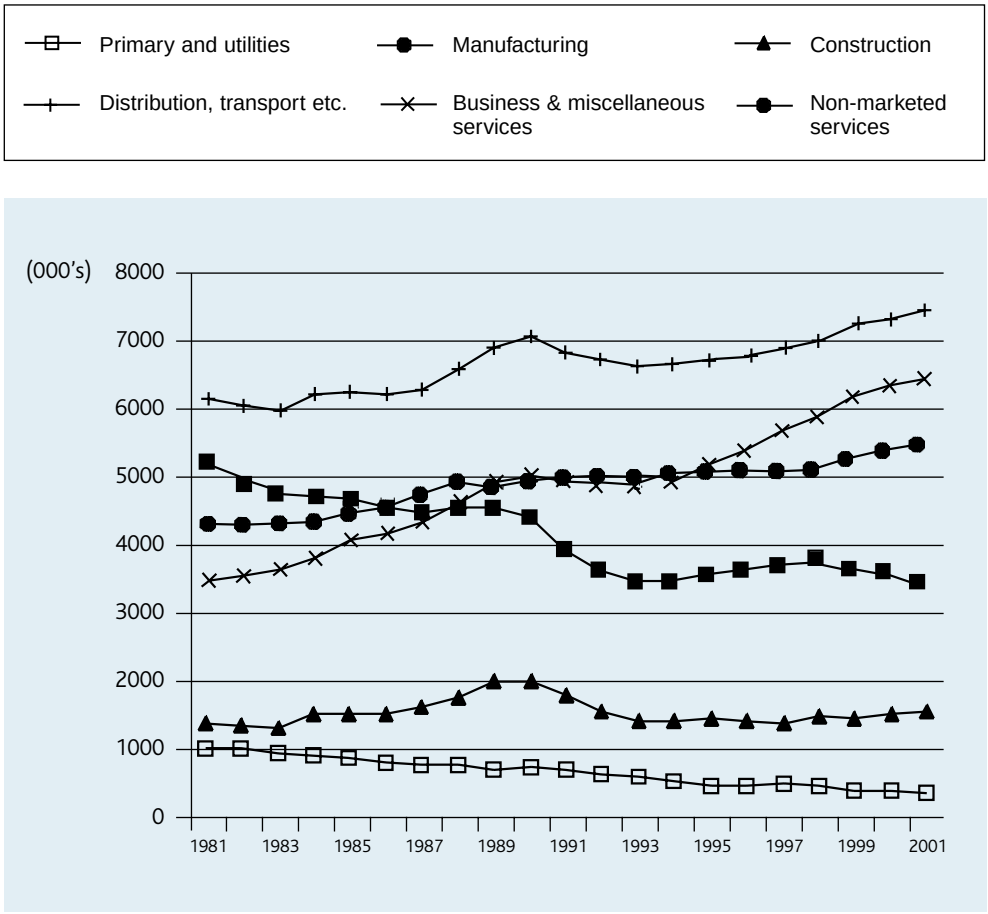
3.25 These patterns have been common across most regions of England as shown in *Tables 3.1* and *3.2*. However, it is clear that some regions have suffered more because of their specialisation in both the primary and manufacturing sectors (notably the Midlands and the Northern regions). Others have benefited from the move towards a more service oriented economy (particularly London and the South East). Overall patterns of employment growth and decline have therefore been quite different across regions. As noted in Chapter 5, this has also influenced the extent to which employers have faced problems of skill deficiencies.

Figure 3.1 Sectoral Structure of Employment in England (numbers employed, in 000's, and %)



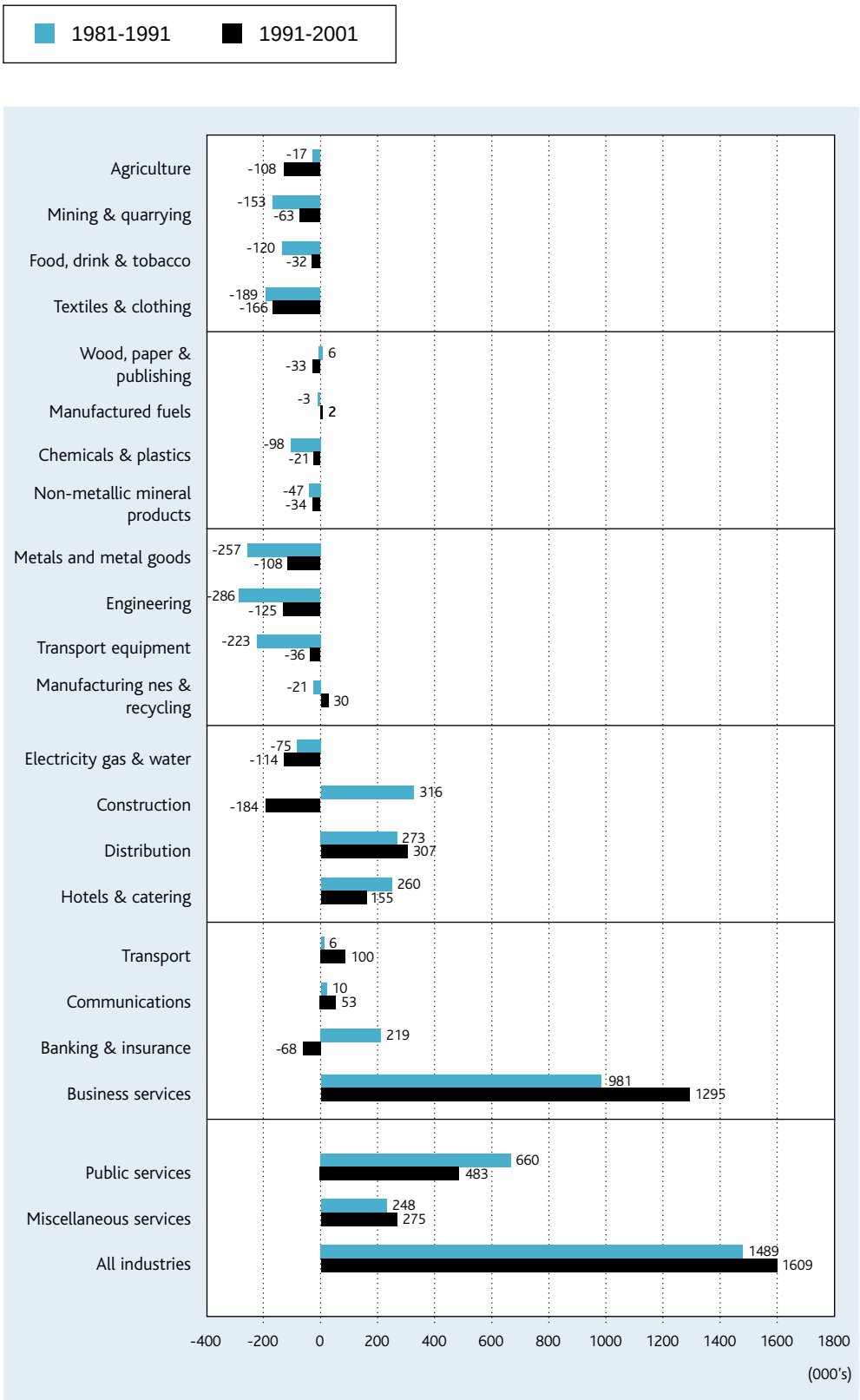
Source: *IER estimates, based on Wilson (2001a).*

Figure 3.2 Employment Trends by Sector, England: 1981-2001 (000's)



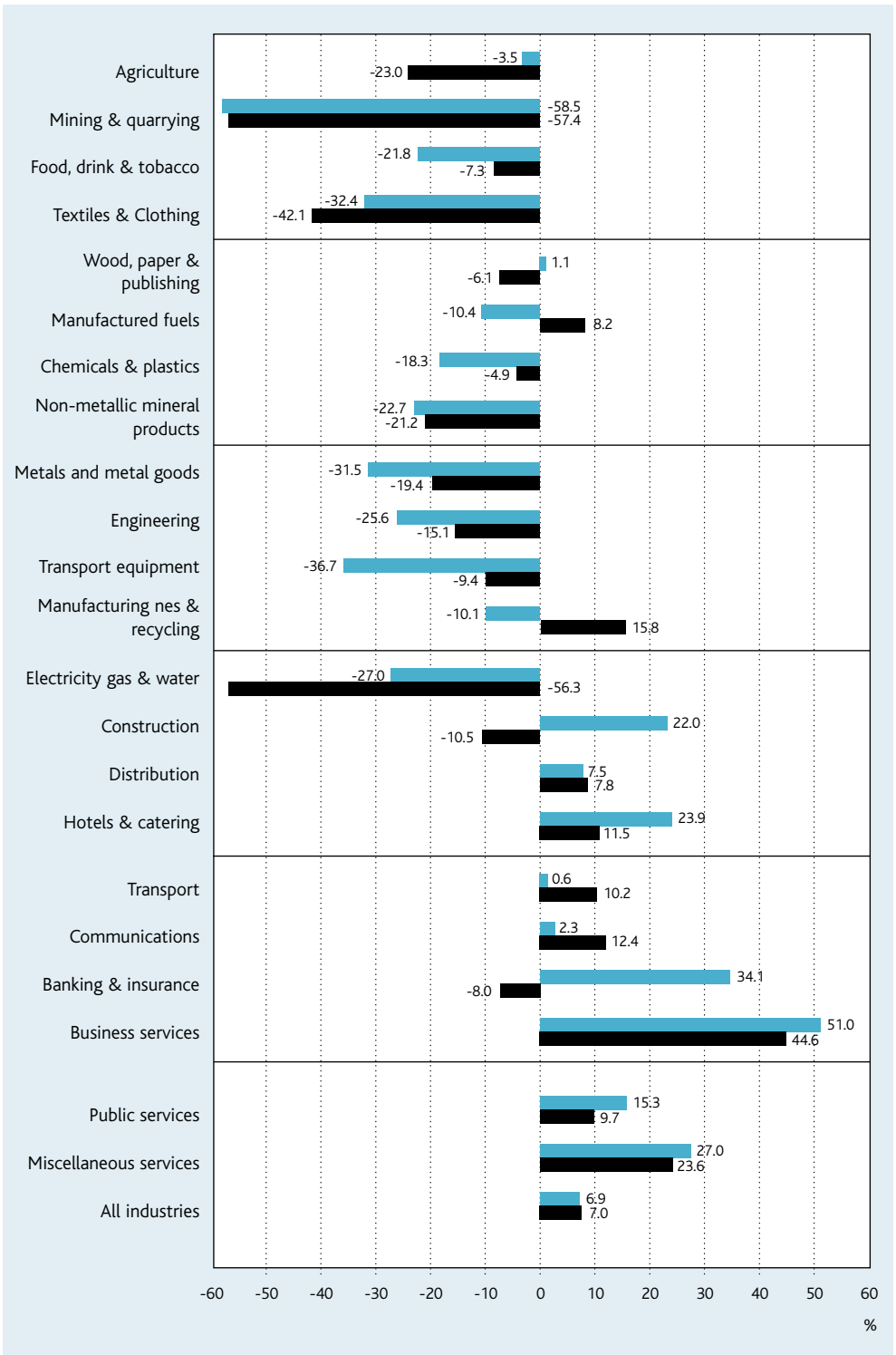
Source: *IER estimates, based on Wilson (2001a).*

Figure 3.3 Changes in Employment by Detailed Sector, England: 1981-2001



Source: *IER estimates, based on Wilson (2001a).*

Figure 3.4 Rates of Employment Growth by Detailed Sector, England: 1981-2001



Source: *IER estimates, based on Wilson (2001a).*

Table 3.1 Employment Change by Sector and Region in England: 1991-2001 (000's)

	Primary Sector and Utilities	Manufacturing	Construction	Distribution, Hotels, Transport etc	Business and Misc. Services	Non-market Services	Total
London	-21	-59	-26	166	509	6	576
South East	-33	-44	-39	115	335	53	387
East of England	-23	-54	-1	107	157	31	218
South West	-41	-15	-22	72	105	77	177
West Midlands	-28	-110	-32	73	100	75	78
East Midlands	-39	-48	3	41	96	60	112
Yorkshire & Humberside	-51	-61	-17	29	93	71	64
North West	-38	-105	-27	20	87	89	26
North East	-11	-29	-22	-8	21	21	-28
England	-285	-524	-184	616	1502	483	1609

Source: *IER estimates, based on Wilson (2001b).*

Table 3.2 Employment Change by Detailed (22) Sectors and Regions: 1991-2001

	London		South East		East of England		SouthWest		West Midlands	
	000's	%	000's	%	000's	%	000's	%	000's	%
Agriculture	1	16.6	-12	-14.2	-16	-24.3	-25	-25.9	-16	-27.1
Mining & quarrying	-4	-45.5	0	-5.3	-1	-12.5	0	-4.1	-8	-70.5
Food, drink & tobacco	-6	-16.4	-2	-6.1	-10	-18.1	1	2.2	-9	-17.8
Textiles & clothing	-9	-27.7	-7	-44.3	-6	-33.0	-12	-46.5	-15	-43.4
Wood, paper & publishing	6	4.8	-9	-9.8	-6	-9.5	-2	-4.3	-5	-12.5
Manufactured fuels	-2	-77.6	0	-11.2	-2	-88.3	1	266.6	0	-13.4
Chemicals & plastics	-9	-24.8	6	9.2	0	0.1	-1	-4.1	-7	-12.4
Non-metallic mineral products	-1	-12.7	-4	-25.7	-2	-16.5	-2	-16.5	-12	-25.1
Metals & metal goods	-14	-39.9	-7	-12.7	-6	-13.4	-2	-6.7	-21	-14.6
Engineering	-23	-34.9	-9	-6.0	-22	-18.8	2	2.4	-24	-18.2
Transport equipment	-2	-12.0	-15	-27.0	-6	-13.7	-4	-7.5	-19	-22.2
Manufacturing nes & recycling	3	16.9	4	13.3	5	24.1	4	28.0	2	8.3
Electricity gas and water	-18	-74.2	-21	-59.2	-6	-32.5	-15	-63.3	-4	-19.1
Construction	-26	-10.3	-39	-11.8	-1	-0.6	-22	-12.0	-32	-18.8
Distribution	58	9.4	71	10.6	65	15.0	44	11.6	38	9.4
Hotels & catering	68	31.2	21	9.1	19	14.6	21	12.2	8	6.6

	London		South East		East of England		SouthWest		West Midlands	
	000's	%	000's	%	000's	%	000's	%	000's	%
Transport	38	16.8	9	5.5	8	7.8	11	16.8	19	21.7
Communications	2	1.5	15	22.1	15	34.7	-3	-7.9	8	20.2
Banking & insurance	-12	-4.7	-6	-4.6	-11	-14.2	-12	-14.0	-3	-4.0
Business services	450	57.9	295	57.7	138	46.8	84	35.1	73	28.8
Public services	6	0.7	53	6.5	31	6.4	77	15.5	75	15.0
Miscellaneous services	71	26.6	46	24.3	30	26.9	33	31.0	29	29.3
All industries	576	14.4	387	10.4	218	9.1	177	7.9	78	3.2

Source: *IER estimates, based on Wilson (2001a).*

Table 3.2 Employment Change by Detailed (22) Sectors and Regions: 1991-2001 (continued)

	East Midlands		Yorkshire & The Humber		North West		North East		England	
	000's	%	000's	%	000's	%	000's	%	000's	%
Agriculture	-8	-17.5	-15	-28.4	-16	-36.3	-1	-5.7	-108	-23.0
Mining & quarrying	-19	-65.8	-19	-72.5	-1	-21.5	-11	-76.7	-63	-57.4
Food, drink & tobacco	6	12.1	-6	-8.5	-6	-8.4	1	2.9	-32	-7.3
Textiles & clothing	-44	-42.3	-27	-44.6	-36	-43.4	-10	-50.0	-166	-42.1
Wood, paper & publishing	-4	-7.7	1	1.5	-9	-13.2	-5	-20.8	-33	-6.1
Manufactured fuels	0	90.5	0	-5.3	5	41.1	0	-25.6	2	8.2
Chemicals & plastics	4	9.8	1	1.8	-11	-12.3	-3	-8.9	-21	-4.9
Non-metallic mineral products	-4	-21.1	-4	-17.9	-3	-13.3	-3	-38.0	-34	-21.2
Metals & metal goods	-7	-14.4	-20	-22.8	-20	-29.3	-10	-25.7	-108	-19.4
Engineering	-15	-19.1	-9	-12.6	-25	-23.1	-1	-3.8	-125	-15.1
Transport equipment	11	38.0	-1	-4.3	-2	-3.8	2	10.2	-36	-9.4
Manufacturing nes & recycling	4	22.1	4	14.6	3	10.1	1	10.1	30	15.8
Electricity gas and water	-13	-62.5	-17	-70.0	-21	-76.7	1	10.4	-114	-56.3
Construction	3	2.2	-17	-10.1	-27	-12.3	-22	-25.0	-184	-10.5
Distribution	17	5.4	7	1.9	10	1.8	-3	-1.5	307	7.8
Hotels & catering	13	14.1	2	1.8	2	1.1	1	1.4	155	11.5
Transport	3	3.7	14	15.4	6	4.5	-7	-16.8	100	10.2
Communications	8	32.9	6	17.5	2	4.5	1	7.5	53	12.4
Banking & insurance	-12	-27.8	-2	-3.6	-10	-10.2	0	-0.7	-68	-8.0
Business services	83	48.9	76	35.0	82	24.2	13	12.9	1295	44.6
Public services	60	15.5	71	14.6	89	13.0	21	7.7	483	9.7
Miscellaneous services	24	30.8	19	18.8	15	9.1	8	14.8	275	23.6
All industries	112	6.0	64	2.8	26	0.8	-28	-2.6	1609	7.0

Source: *IER estimates, based on Wilson (2001a).*

Occupational change

Trends in occupational employment can be examined using data from the Labour Force Survey.

3.26 Using data from the Labour Force Survey, it is possible to examine changes in the broad structure of employment by occupation over the last decade. This is shown in *Figures 3.5* and *3.6*. Data will shortly be available from the 2001 Census which will enable an even more reliable picture to be obtained on trends over the 1990s.

This indicates a strong growth for managerial, professional and related occupations...

3.27 The main changes observed have been the steady increase in the share and number of people employed in managerial, professional and service occupations. This has continued trends evident for over twenty years. It reflects a combination of the effects of changing sectoral employment patterns, which have tended to favour such occupations at the expense of blue-collar workers. However, these sectoral trends have been reinforced by shifts of occupational structure within industries, which have also favoured the same groups. Indeed in recent years it is the latter which has been the driving force behind many of the changes observed. Technological change, as well as significant changes to the way work is organised, has reinforced these patterns.

3.28 The employment share of managerial, professional and associate professional occupations has increased substantially from a third to almost 40% over the decade, an increase of almost 2 million jobs (*see Figure 3.5*). In contrast, the share of skilled trades and process, plant and machine operative jobs fell from around a quarter to just over a fifth, with the loss of around half a million jobs.

3.29 A summary of recent employment change based on the 25 SOC 2000 sub major occupational groups is presented in *Figure 3.7*. Of the 2 million additional managerial, professional and associate professional jobs, over 490,000 have been for corporate managers. In contrast, managers and proprietors (including small business owners such as shopkeepers) have seen a decline of around 72,000.

while there have been severe job losses amongst many manual occupations.

3.30 The most striking decline in jobs numbers has been amongst manual occupations (both skilled and unskilled), although some job losses have also occurred for less skilled white-collar workers. At the start of the 1990s around 40% of all jobs were to be found amongst SOC categories 5, 8 and 9 (skilled trades, process, plant and machine operators, drivers and elementary occupations). By 2001 the proportion of employment accounted for by these jobs had fallen to just over 34%.

3.31 The occupations most seriously affected have been:

- trades, plant and machine related jobs within elementary occupations;
- process, plant and machine operators;
- skilled metal / electrical trades;
- skilled construction trades; and
- administrative, secretarial and related occupations.

Nevertheless, such jobs still account for a significant part of employment although employers often face real problems recruiting new entrants.

3.32 It is important to recognise however, that employment in many of the occupations that have been in long-term decline still accounts for a substantial proportion of the workforce. Moreover, replacement demand, as a result of labour turnover in these occupations, continues to be a key element of overall labour demand patterns (see Chapter 6). This poses a real problem for many employers, since recruitment of new workers into such jobs is often difficult. The past history of job losses acts as a strong discouraging feature for many potential new entrants. This is often reinforced by relatively poor pay and working conditions, coupled with the rising aspirations of many young people following exposure to higher education.

Changes in occupational structure within sectors

Changes in occupational structure have also occurred within sectors.

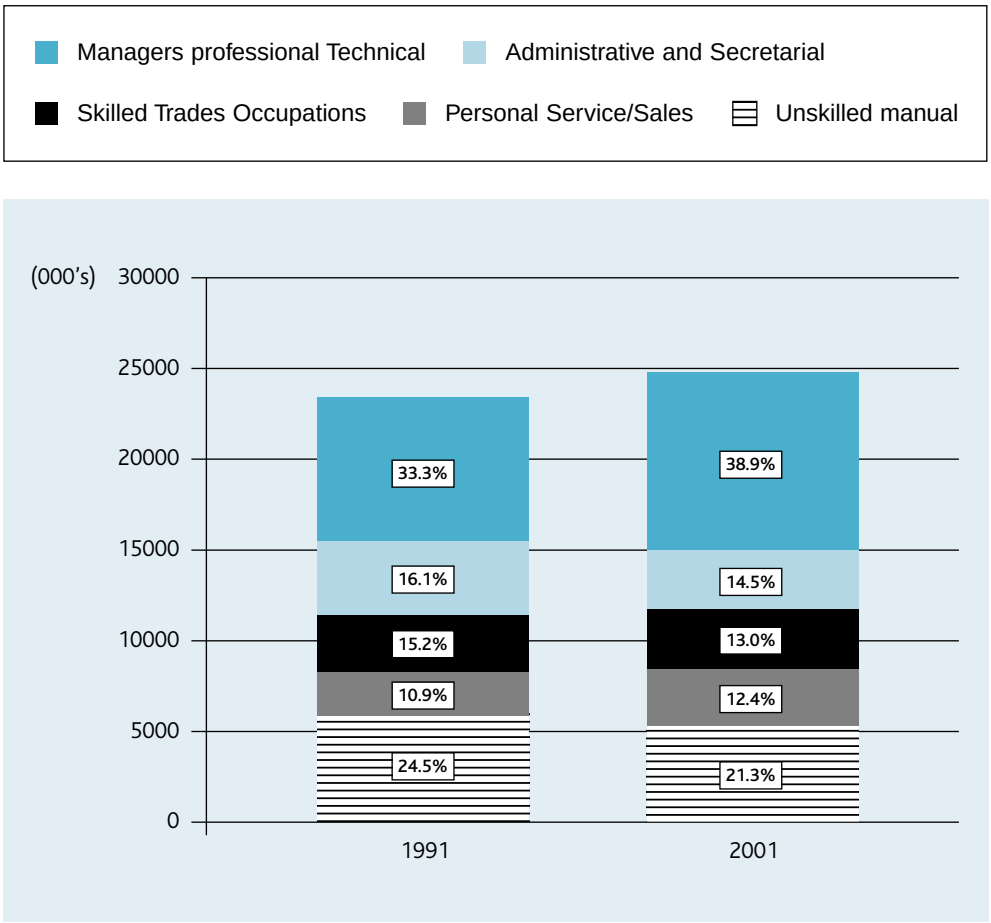
3.33 These changes in occupational structure can be explained, at least in part, by the major sectoral shifts that have taken place, but it is also important to recognise that there are significant changes occurring within sectors. While these changes often have common features, such as the increasing emphasis on professional and managerial skills, there are also important sector-specific issues. The newly formed Sector Skills Development Agency (SSDA) and its individual arms, the Sector Skills Councils (SSCs), have been formed to assess and give voice to sector specific needs. The emerging evidence assembled by these bodies and their predecessors is reviewed at the end of this chapter.

These have generally reinforced the sectoral effects.

3.34 There have been substantial shifts in occupational structure **within** most sectors as shown in *Table 3.3*. The shaded cells highlight those occupations for which the proportion of employment in the sector has declined. All sectors, except distribution and transport, have seen an increase in the proportion of those employed in managerial, professional (and associate professional) occupations. Business services and manufacturing sectors have experienced the most notable increases (*see Figure 3.8*). The decline in the employment share of skilled trades and operatives has been most marked in manufacturing. The loss of administrative and secretarial jobs has largely occurred amongst business services and non-marketed services.

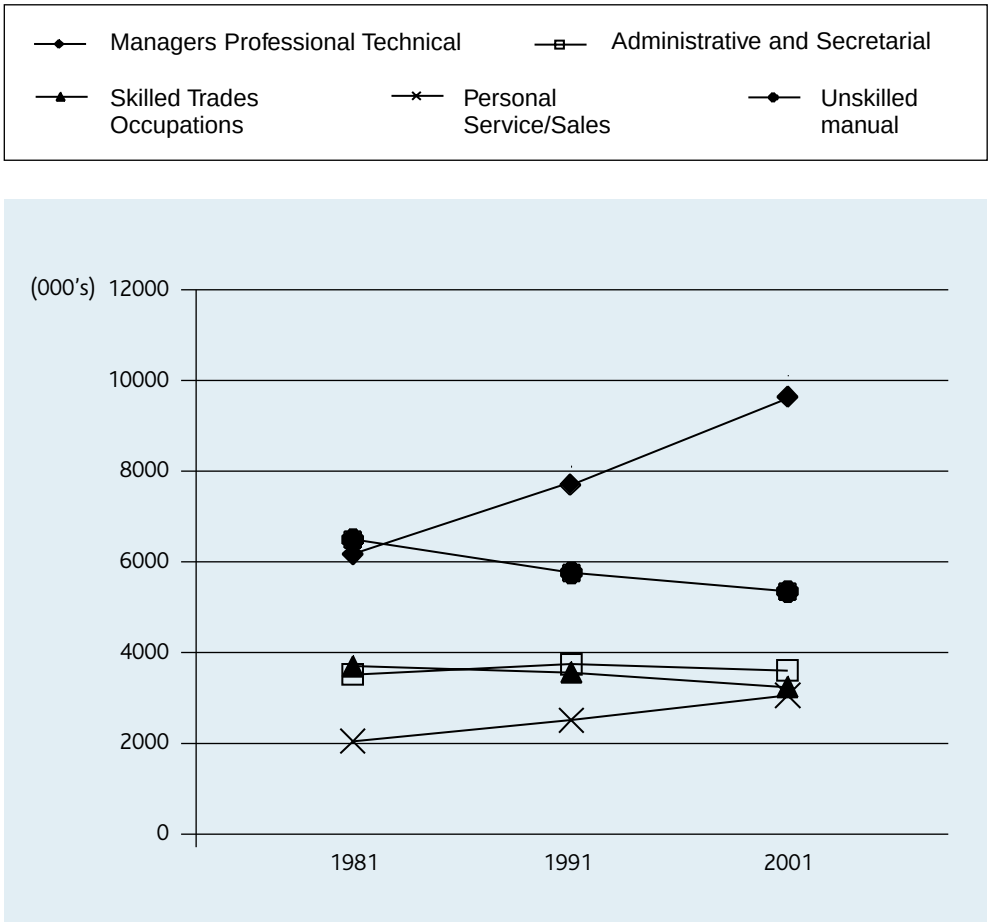
3.35 A more detailed analysis of changes in the structure of employment within the 22 sectors used in Volume 2 of the *Skills in England 2002* is shown in *Table 3.4* and *Figure 3.9*. The rising share of managerial, professional and associate professional jobs is apparent in every sector (*Figure 3.9*).

Figure 3.5 Occupational Structure of Employment, England: 1991 & 2001 (Numbers employed, in 000's, and %)



Source: *IER estimates, based on Wilson (2001a).*

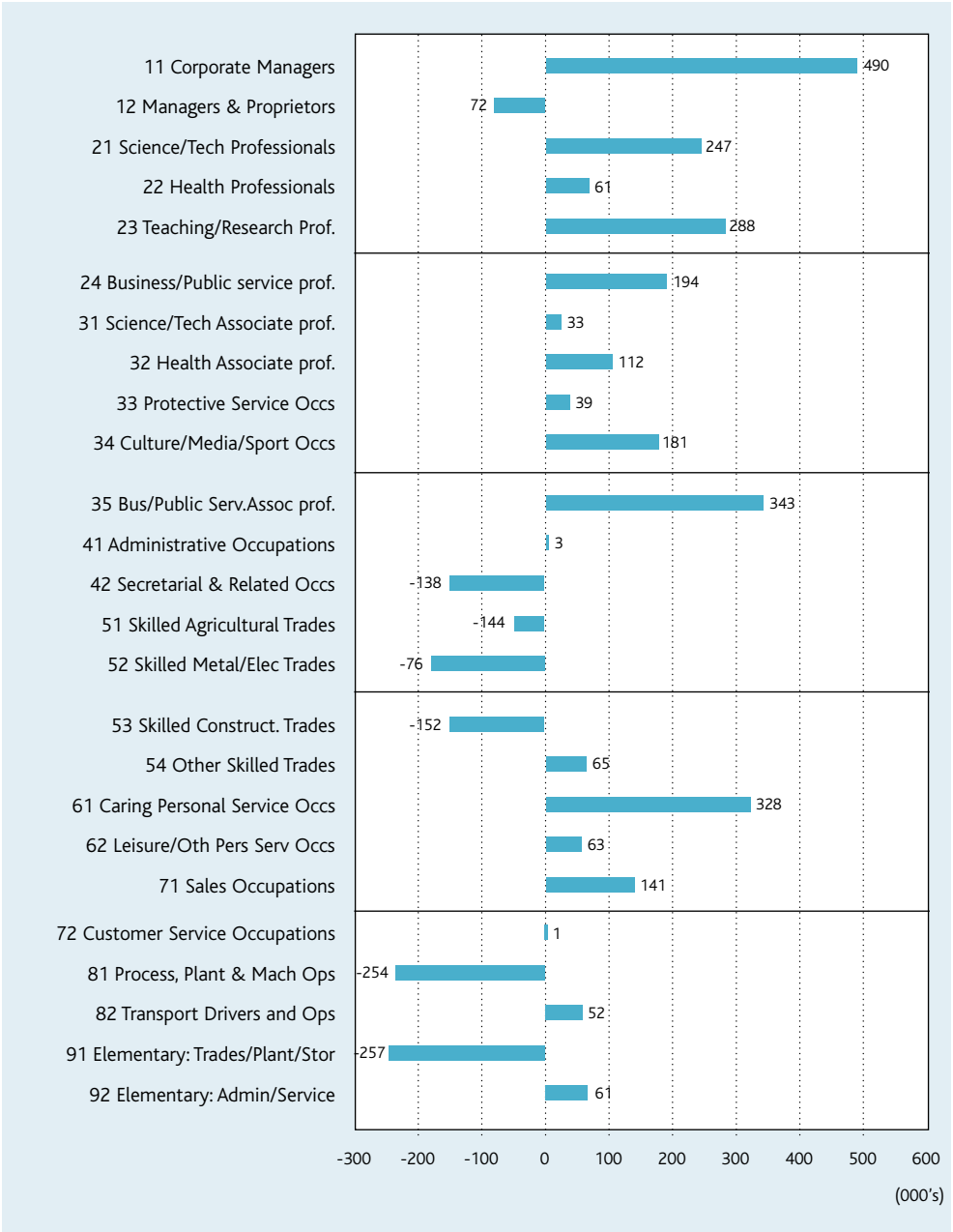
Figure 3.6 Change in Employment by Broad Occupational Group, England: 1981-2001



	1981	1991	2001
Managers Professional Technical	6053	7696	9613
Administrative and Secretarial	3470	3713	3578
Skilled Trades Occupations	3671	3515	3208
Personal Service/Sales	2055	2520	3053
Unskilled manual	6353	5647	5249
Total	**21603**	**23091**	**24700**

Source: *IER estimates, based on Wilson (2001a).*

Figure 3.7 Employment Change by Occupation, England: 1991-2001
(000's)



Source: *IER estimates, based on Wilson (2001a).*

Table 3.3 Occupational Structure–Selected Industries in England:1991 and 2001 (% employed in each occupation)

	Manufacturing		Distribution & Transport		Business		Non-market		Total	
	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Managers & Senior Officials	10	13	18	17	15	16	8	8	13	14
Professional Occupations	5	6	2	3	11	15	22	27	9	12
Associate Professional & Technical	8	9	6	7	15	18	20	21	11	13
Administrative & Secretarial	10	9	12	11	30	24	17	14	16	14
Skilled Trades Occupations	26	24	14	14	5	5	3	2	15	13
Personal Service Occupations	1	1	2	3	5	7	11	13	4	6
Sales & Customer Service Occupations	2	2	17	18	3	3	1	1	6	6
Process, Plant and Machine Operatives	24	21	10	10	4	4	3	2	10	8
Elementary Occupations	14	13	18	17	10	9	14	11	15	13
All Occupations	100	100	100	100	100	100	100	100	100	100

Source: *IER estimates, based on Wilson (2001a).*

Note: *Shaded cells indicate occupations where the proportion of employment in the sector has declined.*

Table 3.4 Occupational Employment Shares by Detailed Industry: 1991 and 2001

row% shares

	Managers and Senior Officials		Professional Occupations		Associate Professional and Technical		Administrative and Secretarial		Skilled Trades Occupations	
	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Agriculture	10.4	11.8	1.0	1.5	1.5	2.4	4.1	4.6	37.8	39.2
Mining & quarrying	7.4	12.7	5.5	7.9	5.4	7.9	9.4	11.1	31.7	23.8
Food, drink & tobacco	8.6	10.9	3.0	3.8	6.3	7.5	10.0	8.6	19.0	18.7
Textiles & clothing	9.1	13.7	1.9	2.9	4.8	7.2	6.5	6.2	17.4	17.8
Wood, paper & publishing	11.2	13.7	3.0	3.7	11.2	14.7	13.9	13.0	26.0	22.2
Manufactured fuels	11.7	13.1	10.6	12.1	9.5	11.1	9.4	9.6	24.1	21.3
Chemicals & plastics	10.9	13.2	7.2	8.4	9.4	10.4	10.8	9.4	15.4	14.1
Non-metallic mineral products	9.3	11.4	3.3	3.9	6.3	7.3	8.8	8.0	24.2	22.8
Metals & metal goods	9.8	12.0	4.5	5.6	5.5	6.5	7.5	7.2	34.6	32.7
Engineering	12.0	14.8	8.9	10.9	9.7	11.3	11.7	10.1	27.1	25.0
Transport equipment	7.6	9.1	7.7	9.1	6.6	7.5	7.7	7.2	35.1	32.8
Manufacturing nes & recycling	9.9	12.6	2.4	3.0	5.1	6.5	8.9	8.2	33.2	31.8
Electricity gas and water	8.2	9.2	10.5	12.3	7.1	7.4	19.1	20.4	29.7	26.1
Construction	9.9	12.1	4.5	5.7	3.6	4.5	8.3	7.7	50.8	47.2
Distribution	18.2	17.0	2.2	2.7	6.9	8.1	11.1	9.9	13.5	13.2
Hotels & catering	26.8	25.4	1.0	1.2	3.7	5.1	6.8	6.1	12.6	15.9
Transport	7.9	9.9	3.7	4.4	6.3	7.5	16.0	16.0	14.2	11.9
Communications	5.4	6.6	3.6	4.4	4.2	4.9	22.6	21.2	23.1	21.8
Banking & insurance	12.7	13.3	4.0	5.1	8.8	10.0	57.8	54.5	2.9	3.2
Business services	16.0	16.9	14.2	17.3	16.5	18.9	28.3	23.1	5.5	4.9
Public services	7.8	8.2	22.4	26.8	20.5	21.4	17.4	14.1	2.8	2.2
Miscellaneous services	16.5	15.1	9.5	11.9	17.2	20.4	12.0	10.0	5.7	5.5
All industries	12.9	13.8	9.3	11.9	11.1	13.3	16.1	14.5	15.2	13.0
000's	2983	3402	2143	2933	2570	3278	3713	3578	3515	3208

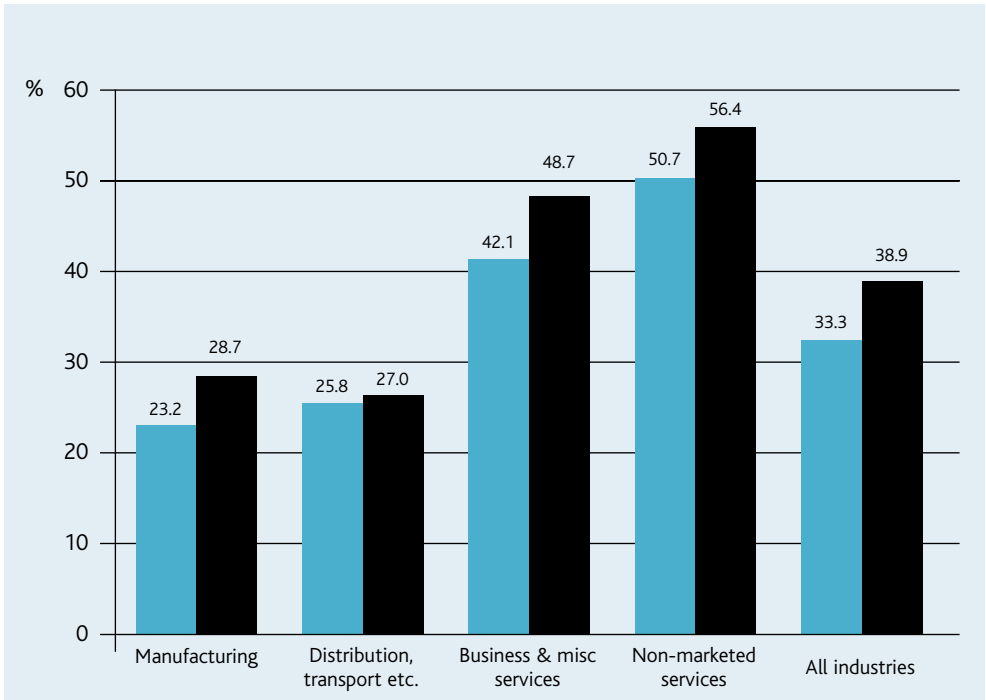
Table 3.4 Occupational Employment Shares by Detailed Industry: 1991 and 2001 (continued)

row% shares

	Personal Service Occupations		Sales and Customer Service Occupations		Process, Plant and Machine Operatives		Elementary Occupations		All Occupations 100%	
	1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
Agriculture	4.5	3.8	8.7	11.3	1.6	1.2	30.5	24.2	471	363
Mining & quarrying	1.0	1.4	15.1	12.0	5.3	6.8	19.3	16.3	109	46
Food, drink & tobacco	0.5	0.5	24.2	22.6	8.0	8.8	20.3	18.4	431	400
Textiles & clothing	1.6	2.0	43.0	33.2	3.1	4.2	12.6	12.8	394	228
Wood, paper & publishing	1.6	2.1	16.6	15.1	4.2	4.4	12.3	11.2	547	513
Manufactured fuels	1.1	1.5	11.8	10.9	8.2	8.3	13.7	12.2	27	29
Chemicals & plastics	1.4	1.7	20.1	17.7	8.0	8.7	16.9	16.4	437	416
Non-metallic mineral products	1.2	1.6	17.3	15.8	8.3	8.9	21.4	20.4	161	127
Metals & metal goods	0.9	1.0	16.0	13.8	6.6	7.2	14.6	14.1	559	451
Engineering	0.9	1.2	13.8	11.6	5.3	5.5	10.7	9.6	832	707
Transport equipment	0.7	0.9	13.6	12.3	7.7	8.0	13.2	13.0	386	350
Manufacturing nes & recycling	0.6	0.9	23.6	20.3	4.3	4.9	12.0	11.7	188	218
Electricity gas and water	1.3	1.9	10.1	9.8	4.3	3.7	9.6	9.3	203	89
Construction	0.3	0.4	8.1	7.8	3.0	3.2	11.4	11.4	1751	1567
Distribution	2.3	2.9	32.4	32.6	3.0	3.1	10.5	10.4	3927	4233
Hotels & catering	2.8	2.9	4.5	4.4	0.7	0.9	41.1	38.3	1348	1503
Transport	3.0	4.1	15.6	14.0	14.5	15.2	18.9	17.1	986	1086
Communications	1.8	2.5	13.3	12.4	9.7	10.3	16.3	15.8	428	481
Banking & insurance	0.9	1.1	6.6	6.6	0.8	0.9	5.4	5.4	860	792
Business services	4.2	5.4	4.8	4.2	1.8	1.8	8.8	7.6	2906	4201
Public services	10.9	13.3	2.5	2.0	1.5	1.3	14.2	10.8	4972	5456
Miscellaneous services	11.3	13.0	6.1	5.3	3.2	3.4	18.5	15.5	1169	1444
All industries	4.5	5.8	12.7	11.4	3.4	3.4	14.7	12.9	23091	24700
000's	1045	1436	2938	2826	794	846	3390	3194		

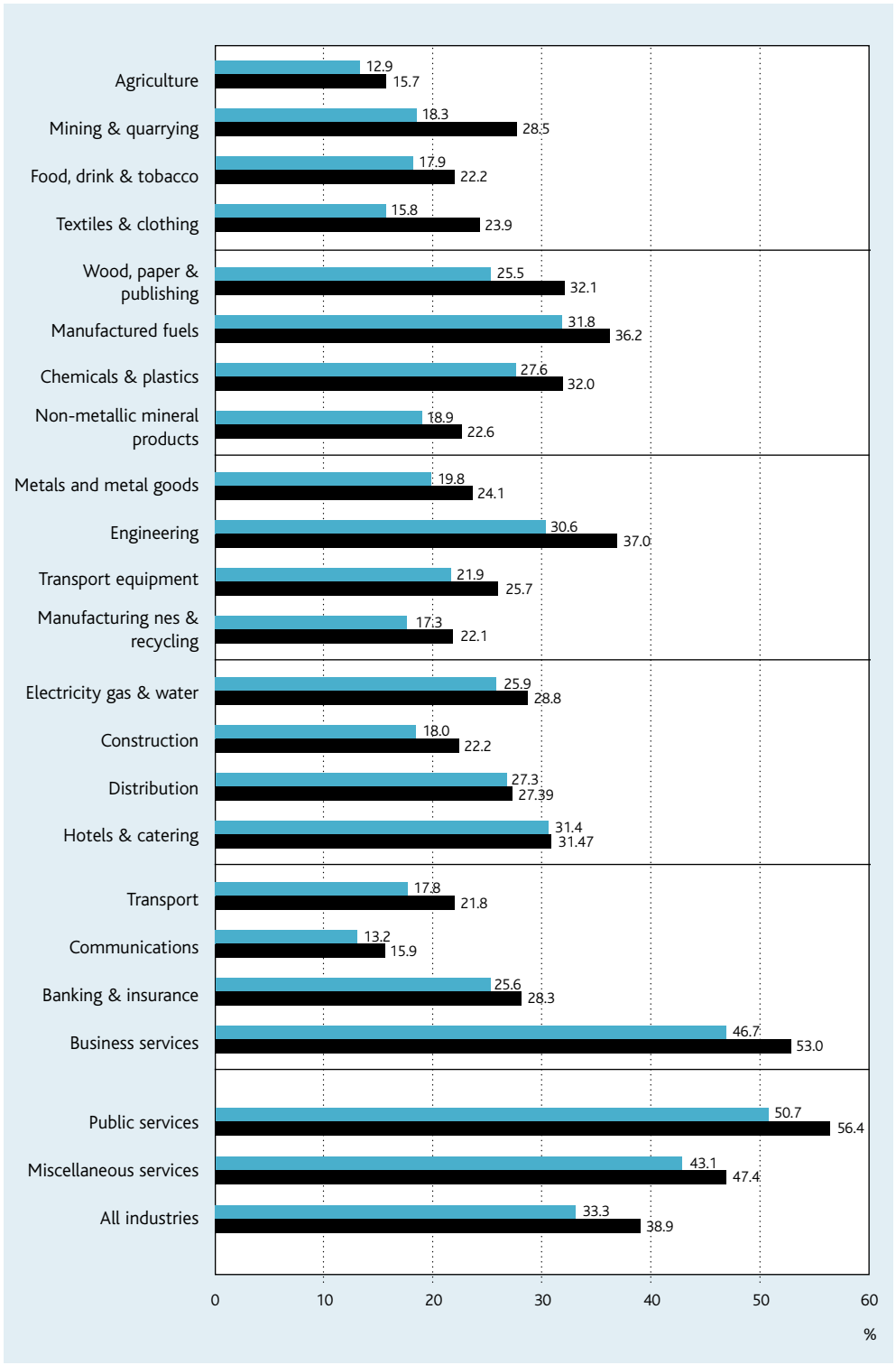
Source: *IER estimates, based on Wilson (2001a).*

Figure 3.8 Proportion of Managers, Professional & Associate Professionals–Selected Industries, England: 1991 and 2001



Source: *IER estimates based on Wilson (2001a).*

Figure 3.9 Proportion of Employment in Managerial, Professional and Associate Professional Occupations by Detailed Sector, England: 1991-2001



Source: *IER estimates, based on Wilson (2001a).*

Table 3.5 Employment Change by Occupation and Region in England: 1991-2001 (000's)

	London	South East	East of Eng.	South West	West Mid.	East Mid.	Y & H	North West	North East	Eng
Managers & Senior Officials	152	101	56	32	17	32	18	7	3	418
Professional Occupations	224	133	68	77	65	50	56	99	17	789
Associate Professional & Technical	245	128	70	57	55	44	38	57	14	709
Administrative & Secretarial	-59	-20	-13	-20	-5	2	10	-23	-9	-135
Skilled Trades Occupations	-15	-24	-11	-22	-53	-35	-49	-65	-33	-307
Personal Service Occupations	51	68	42	44	47	43	37	43	14	391
Sales & Customer Service Occupations	21	21	19	26	14	11	12	12	6	142
Process, Plant and Machine Operatives	-35	-17	-9	-6	-27	-23	-23	-47	-17	-203
Elementary Occupations	-9	-3	-5	-14	-36	-14	-35	-57	-23	-195
Total	576	387	218	177	78	112	64	26	-28	1609

Source: *IER estimates, based on Wilson (2001b).*

Note: *Shaded cells indicate occupations where the numbers in employment in the sector has declined.*

Regional patterns of occupational change

Regional changes have favoured the south-eastern parts of the country...

3.36 Total employment growth has been much stronger in southern and eastern regions of England. This is reflected in *Table 3.5* which shows the main changes in occupational employment. To an extent, these changes reflect the regional variations in sectoral employment trends illustrated in *Table 3.1*. These have had significant implications for occupational trends at the regional level. Recognising that there are important differences in terms of sectoral structure, similar patterns emerge for all regions in terms of the patterns of growth and decline for particular occupations. The shaded cells in *Table 3.5* indicate those occupations where total employment has fallen over the decade.

especially for managerial and professional occupations...

3.37 The numbers of people employed as managers and professionals have increased rapidly in all regions, but especially in London and the South East. Similarly, the growth in employment amongst associate professional and technical occupations has also been concentrated in the South East and London, with more modest increases elsewhere.

but others have seen a more even spread.

3.38 Employment growth for personal service and sales and customer service occupations has been more evenly distributed across the regions. The experience of administrative and secretarial occupations is more mixed with absolute declines in London, the South West, the North West and the North East, but increases elsewhere.

Manual occupations have suffered across most regions.

3.39 Skilled trades, process, plant and machine operatives and elementary occupations have experienced employment decline across all regions except in the South East. The largest job losses have occurred in the North West and West Midlands.

Qualifications of the Employed Workforce

Measuring the demand for qualifications is difficult since numbers employed reflect both demand and supply.

3.40 There are problems in measuring the demand for formal qualifications. In particular it is very difficult to distinguish demand from supply. Information is available from the Labour Force Survey (LFS), in combination with other sources, on the qualifications held by those in employment. However, it is important to recognise that these are the consequence of both demand and supply influences.

This has been driven by changes in the occupational structure of employment.

3.41 A key factor behind the increase in the overall proportion of persons holding higher level qualifications was shifts in occupational structure in favour of those (higher level) occupations which tend to employ large proportions of qualified people. Between 1991 and 2001, total employment in these categories grew by around 2 million.

The proportion of those employed with formal qualifications is also growing rapidly...

although it also reflects the rapid increase in educational participation rates.

3.42 In addition, the proportions employed in each occupational category holding particular levels of qualifications have also increased. This has affected both the public and private sectors although it is the latter which has seen the most rapid growth (Wilson, 2002).

3.43 It is important to recognise that these increases are also, in part at least, supply driven. The increased participation in higher education that has been encouraged by both the present and previous Governments, has inevitably led to a sharp rise in the qualifications held by the employed workforce. These trends are discussed in more detail in Chapter 4.

The numbers qualified at intermediate and lower levels have also risen, but a substantial proportion still have no formal qualifications.

3.44 The proportions in employment holding intermediate and lower level qualifications have also risen in recent years although not as rapidly as for higher-level qualifications. This reflects the fact that many of those acquiring such qualifications go on to obtain even higher-level qualifications. According to the LFS, by 1991 about three quarters of the employed workforce had formal qualifications of some kind. This had risen to around 90% by the year 2002, by which time almost 50% of the employed workforce was qualified to at least NVQ level 3. However, even by 2002 some 12% of the workforce still had no formal qualifications and over 30% were qualified below NVQ level 2.

There has also been an increase in vocational qualifications held, with many new qualifications being introduced.

3.45 There have been a number of innovations in the area of intermediate and lower level qualifications in recent years, with the introduction of GNVQs and other new vocational qualifications. Pressures to raise standards, combined with changing emphasis on different aspects of the curriculum etc., have resulted in rising success rates in GCSEs and A-Levels. These, essentially supply-side, changes have been reflected in rising employment shares for people holding such qualifications.

3.46 As noted in Chapter 4, at NVQ level 3, the flow obtaining A-level or equivalent qualifications rose very sharply in the 1990s. This rate of growth was surpassed by various new qualifications such as GNVQ, which grew from nothing to quite substantial levels in just a few years. In contrast, some of the more traditional qualifications at this level have seen a decline in total numbers.

The flow of those obtaining A-levels and other NVQ level 3 qualifications has risen steadily...

3.47 When the total stocks of persons holding such qualifications as their highest qualification are assessed, a somewhat different picture emerges. As *Table 3.6* shows, on this measure, the overall numbers with NVQ level 3 as their *highest* level qualification rose only modestly between 1992 and 2002. This is because of the focus on 'highest qualification held'. The overall numbers holding such qualifications have risen rapidly but many people have 'upgraded' and now hold A-levels or degrees.

but the impact on the stocks of those with these as their highest qualification has been modest, since many have gone on to acquire even higher qualifications.

3.48 At NVQ level 2, it is a similar story. Rapid growth in the flows during the 1990s was not reflected in dramatic increases in the stocks because even more individuals have gone on to acquire higher level qualifications. At NVQ level 1 the pattern is similar; RSA, BTEC first certificates and other such qualifications have seen the fastest rates of increase, while the total number of those with GCSE below grade C as their highest qualification has remained stable at around 4 million.

The position at NVQ level 1 and 2 is similar, with little change in the stocks despite increased flows.

3.49 Wilson (2001a) considers how trends have varied *between* occupations in greater detail. All occupational groups are becoming more qualified as measured, for example, by the proportion of employees qualified to NVQ level 3 or equivalent and above (*see Table 3.7*). The increase is greatest amongst managers and admin and secretarial occupations, with a large increase also among those employed in sales occupations.

Increases at NVQ level 3 or above have been concentrated in managers and clerical and secretarial occupations.

3.50 For higher level qualifications, the fastest increases have been amongst professional occupations (NVQ level 5), managers (NVQ level 4 and 5) and amongst associate professionals (NVQ level 4). There has also been a general increase for NVQ levels 3 and 4 across many occupations, including admin and secretarial and sales occupations.

The growth for higher level qualifications has been greatest amongst professionals.

3.51 Higher level qualifications (NVQ level 4 and 5) are heavily concentrated amongst particular occupational categories (notably managerial and professional jobs). The proportions qualified at this level have been rising steadily and for some occupations are approaching 100%. The proportions qualified at this level have also risen in many other occupations (especially amongst associate professional groups). For example teachers, and more recently nurses, have seen moves towards an all graduate profession. Some have argued that this represents qualifications inflation. The more general consensus is that it reflects real changes to the job requirements.

Many occupations are approaching 100% qualified at graduate level. This has raised some concerns about over-qualification and qualification inflation.

3.52 The analysis in Wilson (2001a) also illustrates that there has been a general increase in the proportions qualified at intermediate and lower levels across nearly all occupations. This is less marked than for higher level qualifications, mainly because many people who previously held level 3 qualifications as their highest qualification have now been replaced by people with qualifications at level 4 and 5. For higher level occupations, in particular, there

Other occupations have also seen sharp increase in proportions qualified at lower levels.

has been a tendency for the structure to shift away from NVQ level 3 towards levels 4 and 5.

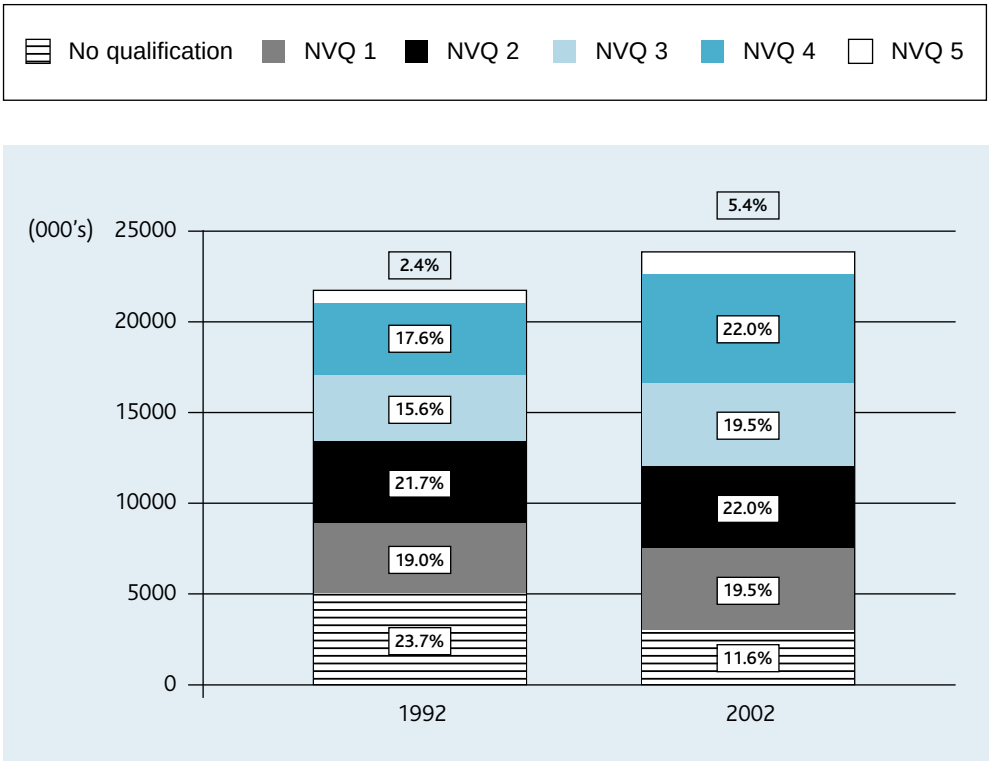
NVQ 3 level qualifications remain the norm amongst many occupations....

3.53 Qualification at NVQ level 3 remains significant amongst managers, associate professionals, clerical and secretarial, skilled trades personnel and service occupations and process, plant and machine operatives. In all of these, other than around 15% or more of the employed workforce are currently qualified at that level. For skilled trades it is even higher at around 25%.

but many occupations still have large numbers with no formal qualifications.

3.54 Lower level qualifications are spread much more evenly across all occupations than are higher level qualifications. The proportions holding no formal qualifications have fallen sharply in most occupations. However, it is notable that there are still significant numbers of high status occupations such as managers who hold no formal qualifications.

Figure 3.10 Qualification of Individuals in Employment, England: 1992 and 2002 (000's and %)



Source: *Labour Force Survey Match-May 1992, 2002.*

Table 3.6 Numbers and Percentage Shares in Employment in England: 1992 and 2002

	Number (000's)		Percentage	
	1992	2002	1992	2002
Qualifications				
NVQ 5, Higher degree	**510**	**1286**	**2.4**	**5.3**
NVQ 4, First degree & equivalent	2079	3184	9.8	13.2
NVQ 4, HE below degree level	181	415	0.9	1.7
NVQ 4, HNC BTEC & RSA higher etc.	609	989	2.9	4.1
NVQ 4, Nursing and teaching	879	706	4.2	2.9
NVQ 4 total	**3748**	**5295**	**17.7**	**22.0**
NVQ 3, A level & equivalent	905	1484	4.3	6.2
NVQ 3, GNVQ advanced		176	0.0	0.7
NVQ 3, ONC BTEC national etc.	2407	3053	11.4	12.7
NVQ 3 total	**3313**	**4712**	**15.7**	**19.6**
NVQ 2, GCSE (grades A-C)	2462	2917	11.6	12.1
NVQ 2, GNVQ intermediate		122	0.0	0.5
NVQ 2, BTEC 1st diploma etc.	2123	2236	10.0	9.3
NVQ 2 total	**4586**	**5275**	**21.7**	**21.9**
NVQ 1, GCSE (below grade C)	3283	3771	15.5	15.7
NVQ 1, GNVQ foundation		13	0.0	0.1
NVQ 1, BTEC 1st certificate etc.	723	913	3.4	3.8
NVQ 1 total	**4006**	**4697**	**18.9**	**19.5**
No Qualifications	**4994**	**2800**	**23.6**	**11.6**
Total	**21156**	**24065**	**100.0**	**100.0**

Source: *Labour Force Survey, March-May 1992, 2002.*

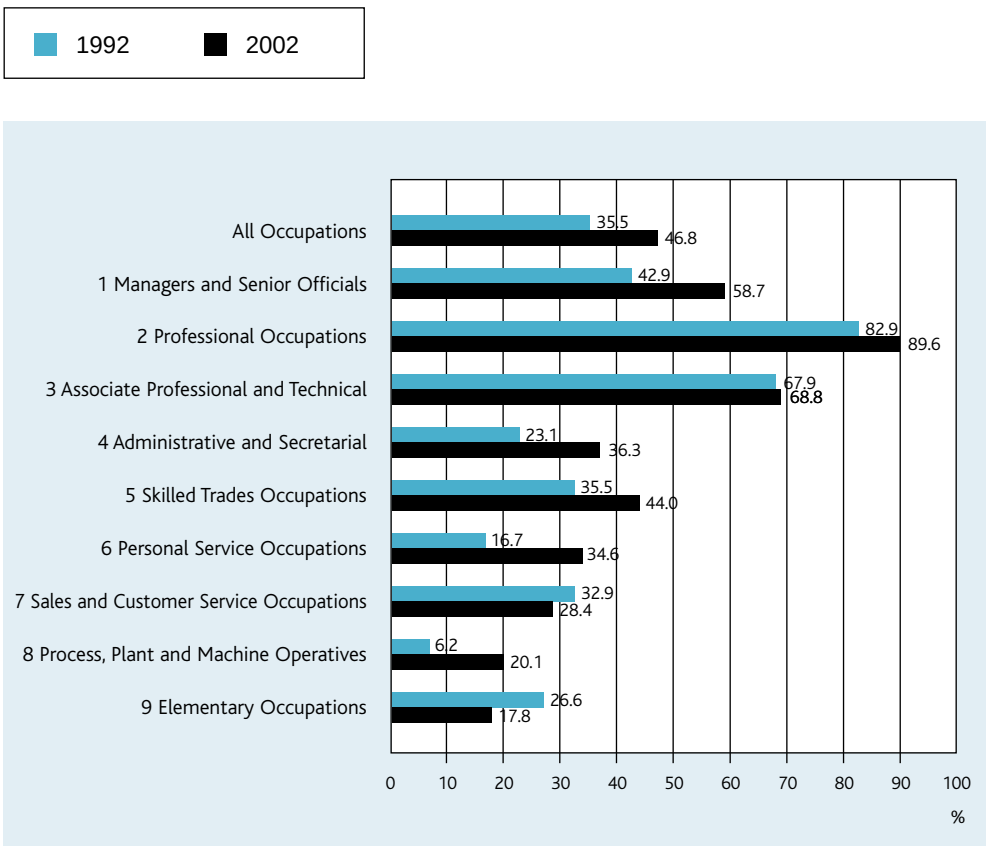
Notes: *These estimates differ slightly from those published elsewhere by DfES (for example, in Skills for All: Research Report from the National Skills Task Force, Table 4.1). These differences arise for a number of reasons, including different ways of dealing with those respondents who indicate that they do not know what qualifications they hold or who failed to answer this question and different treatment of those on Government training schemes. The IER estimates are also based on data for just those individuals whose occupation is known.*

Table 3.7 Qualification level by Occupation, England: 1992 and 2002 (000's and % in each occupation)

		NVQ5		NVQ4		NVQ3		NVQ2		NVQ1		No Quals.		Total	
		1992	2002	1992	2002	1992	2002	1992	2002	1992	2002	1992	2002	1992	2002
Managers & Senior Officials	000s	85	259	633	1086	457	711	624	707	485	491	457	248	2741	3502
	%	3.1	7.4	23.1	31.0	16.7	20.3	22.8	20.2	17.7	14.0	16.7	7.1	100.0	100.0
Professional occupations	000s	289	719	1344	1519	188	241	200	164	130	105	766	19	2227	2767
	%	13.0	26.0	60.3	54.9	8.4	8.7	9.0	5.9	5.8	3.8	3.4	0.7	100.0	100.0
Associate Professional & Technical	000s	75	201	863	1450	375	634	482	571	365	367	301	99	2462	3322
	%	3.1	6.0	35.1	43.6	15.3	19.1	19.6	17.2	14.8	11.1	12.2	3.0	100.0	100.0
Administrative & Secretarial	000s	21	49	287	468	477	627	905	925	922	845	571	238	3183	3152
	%	0.6	1.6	9.0	14.8	15.0	19.9	28.4	29.4	29.0	26.8	17.9	7.5	100.0	100.0
Skilled Trades Occupations	000s	12	14	197	202	794	1010	826	701	507	476	778	385	3115	2788
	%	0.4	0.5	6.3	7.2	25.5	36.2	26.5	25.2	16.3	17.1	25.0	13.8	100.0	100.0
Personal Service Occupations	000s	10	15	138	230	182	343	275	490	241	411	326	207	1172	1694
	%	0.9	0.9	11.8	13.6	15.5	20.2	23.4	28.9	20.5	24.2	27.8	12.2	100.0	100.0
Sales and Customer	000s	10	12	149	142	414	372	638	537	676	495	972	295	2859	1852
Service Occupations	%	0.3	0.6	5.2	7.7	14.5	20.1	22.3	29.0	23.6	26.7	34.0	15.9	100.0	100.0
Process, Plant and	000s	2	9	30	65	93	319	127	492	144	634	263	434	659	1954
Machine Operatives	%	0.3	0.5	4.6	3.3	14.2	16.3	19.2	25.2	21.8	32.5	40.0	22.2	100.0	100.0
Elementary Occupations	000s	4	6	125	110	354	402	575	686	609	847	1326	862	2993	2913
	%	0.1	0.2	4.2	3.8	11.8	13.8	19.2	23.6	20.4	29.1	44.3	29.6	100.0	100.0
Total	000s	508	1282	3768	5271	3335	4659	4652	5273	4078	4671	5071	2787	21411	23944
	%	2.4	5.4	17.6	22.0	15.6	19.5	21.7	22.0	19.0	19.5	23.7	11.6	100.0	100.0

Source: *IER estimates, based on the Labour Force Survey, March-May 1992 and 2002.*

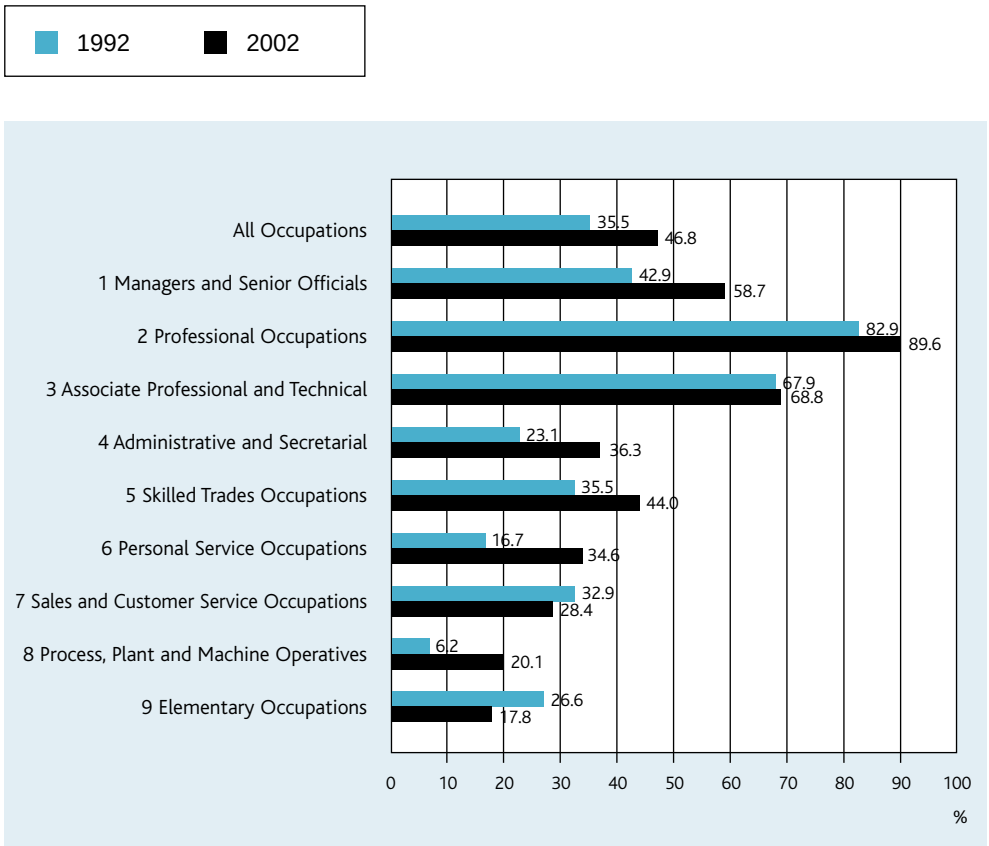
Figure 3.11 Percentage of Employees Qualified to NVQ3 and above, by Occupation, England: 1992 and 2002



Source: *IER estimates based on the Labour Force Survey, March-May, 1992 and 2002.*

Notes: *SOC 2000.*

Figure 3.12 Percentage of Employees with No Qualifications, by Occupation, England: 1992 and 2002



Source: *IER estimates based on the Labour Force Survey, March-May, 1992 and 2002.*

Notes: *SOC 2000.*

Trends in Skill Requirements: New Survey Evidence

Occupations and qualifications provide only a partial picture of trends in skill requirements.

3.55 The evidence on occupational trends, as well as that on qualifications trends, suggests that skill levels have risen substantially over the last decade. However, this is only a partial picture of skill trends. In particular, it is important to consider the changing nature of jobs *within* particular occupation titles.

Employers have emphasised the importance of key and generic skills.

3.56 A further concern is that increasing educational attainment and growth in the use of formal qualifications does not imply that these are either necessary or appropriate. For many years employers have emphasised that possession of formal qualifications does not necessarily mean that individuals have the kinds of skills that are needed to meet the requirements of the modern workplace. This has been reflected in a small but growing body of research focused upon key and generic skills. A number of new surveys have attempted to track trends in such skills, using a variety of approaches.

New survey evidence confirms that these are increasing in importance.

3.57 The Learning and Training at Work Survey, first conducted in 1999 (and repeated in 2000 and 2001), suggests that the great majority of employers believe that the skills demanded from their employees are increasing (Spilsbury, 2001).

Four individual surveys enable the trends in broad skill demands to be traced since the mid-1980s.

3.58 Another series of studies has focused on the skills actually used by workers in the jobs that they do. These studies are based on individual employees' responses to detailed surveys about the skills and qualifications both used and required in their jobs. The responses can therefore be regarded as being reflective of the demand for skills. The two Skills Surveys of 1997 and 2001 (Ashton *et al*., 1999 and Felstead *et al*., 2002 respectively) were designed, in part, to extend three broad indicators of skills derived from (a) the training time, (b) the learning time and (c) the formal qualifications required to get and to do jobs. These three measures were first used in the SCELI survey in 1986, and then were used again in the 1992 Employment in Britain Survey. Thus, these measures enable trends in broad skill demands to be traced over the period since the mid-1980s.

The results confirm that jobs typically are becoming more demanding in terms of formal qualifications needed and learning and training required.

3.59 *Table 3.8* documents the trends in these three measures of skills. The surveys are restricted to those respondents in work and aged between 20 to 60 years of age. The overall trend is an increase in the required level of skills over the last 15 years. The respondents also report that the skills they use at work are increasing, which confirms this finding. For example, in 2001, 59% reported that their skills had increased over the last 5 years. Training times and the time required to learn to do the job well both increased significantly, while the required qualifications index also shows a substantial increase over the period, although the latter is perhaps more susceptible to reflecting the supply of those with higher qualifications as reported in Chapter 4 as well as the demand.

Table 3.8 Training and Learning Time and Highest Qualification Required in Britain: 1986-2001 (sample percentages and indices)

	1986	1992	1997	2001
Training Time:[1]				
less than 3 months	66	63	57	61
more than 2 years	22	22	29	24
Training time index	*2.01*	*2.21*	*2.53*	*2.27*
Learning Time:[2]				
less than 1 month	27	22	21	20
more than 2 years	24	22	24	26
Learning time index	*3.30*	*3.36*	*3.48*	*3.57*
Highest Qualification Required:[3]				
Level 4 or above	20	26	24	29
Degree	*10*	*13*	*14*	*17*
Sub-degree	*10*	*12*	*10*	*12*
Level 3	15	17	14	16
Level 2	18	19	21	16
Level 1	8	5	9	12
No qualifications	38	34	32	26
Required qualifications index	*1.71*	*1.95*	*1.90*	*2.10*

Source: *Felstead et al. (2002), Table 4.1.*

Notes:

1. Respondents to all four surveys were asked: 'Since completing full-time education, have you ever had, or are you currently undertaking, training for the type of work that you currently do? Respondents answering 'yes' were then asked: 'How long, in total, did (or will) that training last?' A range of options was given. The Training Time Index was calculated from the responses: none=0; less than 1 month=1; 1-3 months=2; 3-6 months=3; 6-12 months=4; 1-2 years=5; and over 2 years=6.

2. Respondents to all four surveys were asked: 'How long did it take for you after you first started doing this type of job to learn to do it well?' This question was asked only of employees in 1986 and so the 1992, 1997 and 2001 figures have been restricted accordingly. The Learning Time Index was calculated from the responses: less than 1 month=1; less than 3 months=2; 3-6 months=3; 6-12 months=4; 1-2 years=5; and over 2 years=6.

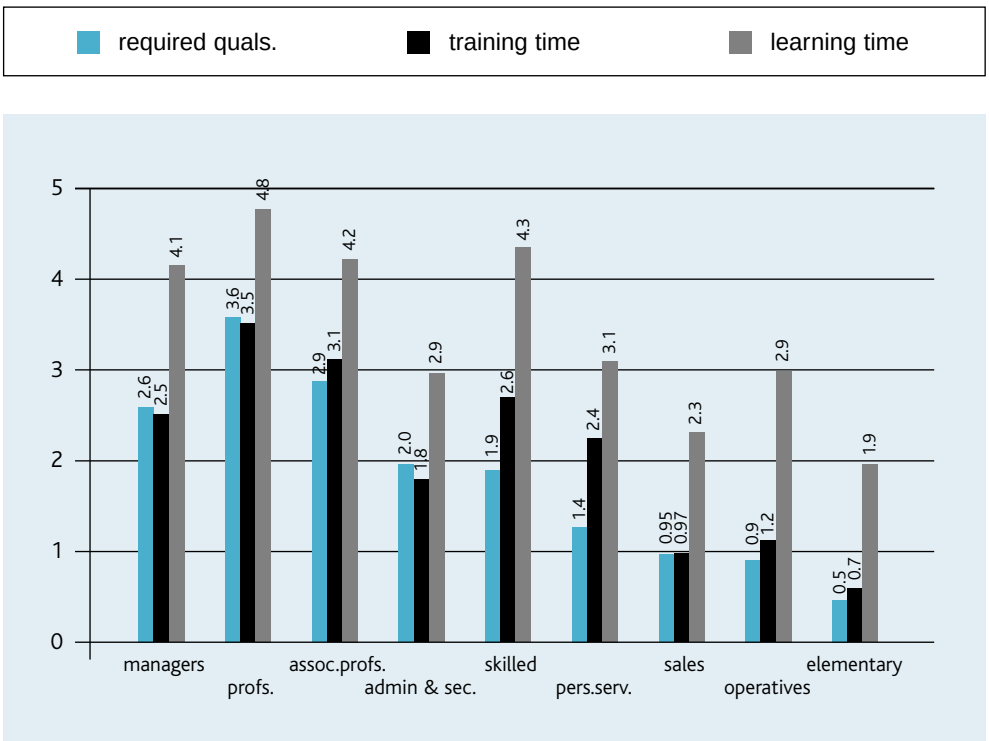
3. Respondents to all four surveys were asked: 'If they were applying today, what qualifications, if any, would someone need to get the type of job you have now?' A range of options was given. From this the highest qualification level, ranked by NVQ equivalents, was derived. The Required Qualifications Index was calculated from the responses: none=0; level 1=1; level 2=2; level 3 =3; and level 4 or above=4.

3.60 Felstead *et al*. (2002) report that for full-time workers, there are now few, if any, differences between men and women in these three skills measures. However, female part-time workers are significantly less skilled than female full-time and male full-time workers.

3.61 Utilising the required qualification, training and learning time indices constructed for *Table 3.8*, the distribution of these broad skills by occupation is illustrated in *Figure 3.13*. In general, jobs at the top of the occupational hierarchy require more training and learning time, as well as a higher level of prior qualification. However, managerial workers are less skilled on these three criteria than professionals and associate professional and technical workers. Of course, part of the explanation for this lies in the fact that the managerial category includes many of the self-employed who are traditionally in low-skilled jobs, as shown in Felstead *et al*. (2002).

These broad skill measures differ considerably by occupation...

Figure 3.13 Distribution of Broad Skills Occupation



Source: *Felstead et al. (2002), Table 3.2.*

Note: *Indices, see Table 3.8 for details.*

and by industry...

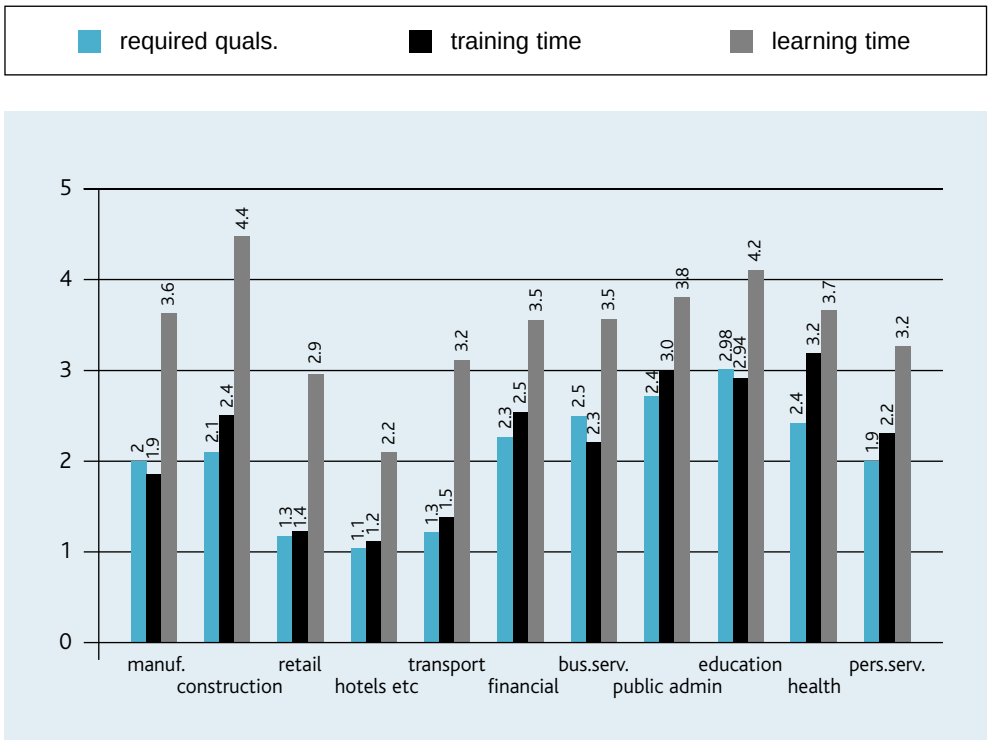
3.62 *Figure 3.14* illustrates the distribution of the three indices of broad skills across some selected industry groups. There are wide differences in all three measures of skills by industry. As discussed by Felstead *et al*. (2002), jobs in Hotels and Restaurant have very low skills demand – 50% require no prior qualifications, 64% need no training, and almost half can be learned to do well in less than one month. In contrast, jobs in the Public Administration and Education sectors have very high demands for skills – almost 60% require NVQ level 4 or above qualifications, 29% take over two years to train for and 39% take more than two years to learn to do well.

but are similar across regions.

3.63 *Figure 3.15* shows that there is much less variation in skills by region than by occupation or industry sector.

3.64 The Skills Survey of 1997 and 2001 also enable measures of the demand for generic skills to be constructed. Respondents were asked a wide range of questions regarding the nature of their jobs and the skills that they used, and their responses were combined to produce a measure of the utilisation of 10 different generic skills amongst the workforce. Full details are provided in Dickerson and Green (2002).

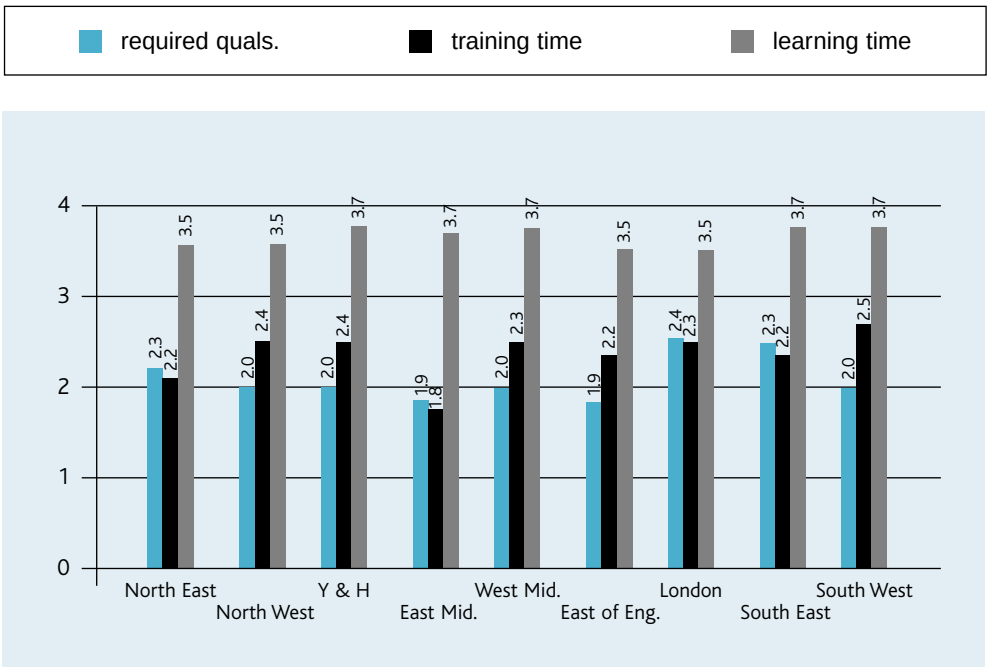
Figure 3.14 Distribution of Broad Skills by Industry



Source: *Felstead et al. (2002), Table 3.4.*

Note: *Indices, see Table 3.8 for details.*

Figure 3.15 Distribution of Broad Skills by Region



Source: *Felstead et al. (2002), Table 3.5.*

Note: *Indices, see Table 3.8 for details.*

The Skills Surveys enable 10 generic skills to be identified.

3.65 The 10 generic skills identified by Dickerson and Green (2002) are:

- literacy skills;
- physical skills;
- number skills;
- technical know-how;
- high-level communication;
- planning skills;
- client communication;
- horizontal communication;
- problem-solving; and
- checking skills.

A full description of each these skills is provided in *Annex A, Table A5*.

These are related to occupational groups but provide a richer classification of skills used.

3.66 *Table 3.9* reveals that there is a good correspondence between broad occupational classification and the generic skill indices. For example, those engaged in managerial occupations are using above average levels of high-level communication, planning and client communication skills. Managers are similar in this regard to those engaged in professional occupations, but the latter are characterised by higher levels of literacy and high-level communication and lower levels of client communication. Workers in craft occupations utilise both physical skills and what Dickerson and Green (2002) have termed technical know-how, and can be contrasted with operatives and other elementary occupations which, while also demanding physical skills, require little in the way of technical know-how, and score well below average on communication skills. Client communication skills are important to those in sales-based occupations, but are apparently not combined with other skills dimensions unlike those in managerial occupations. Thus the measures of generic skills appear to be sensibly related to occupations, while providing a richer and more detailed classification in terms of what skills different occupations utilise.

Table 3.9 Mean Levels of Generic Skills by 1-Digit Occupation Classification

		1-Digit Occupation Classification								
	generic skills	managers etc.	professionals	associate professionals	clerical	craft etc.	personal and protective	sales	operatives	elementary
1	literacy skills	0.33	0.62	0.38	0.16	-0.29	-0.14	-0.30	-0.55	-0.98
2	physical skills	-0.37	-0.50	-0.34	-0.50	0.72	0.40	-0.08	0.64	0.78
3	number skills	0.51	0.44	0.09	0.07	0.00	-0.54	0.06	-0.32	-0.85
4	technical know-how	0.06	0.04	0.16	-0.15	0.63	-0.33	-0.13	0.04	-0.51
5	high-level communication	0.56	0.88	0.39	-0.31	-0.27	-0.22	-0.29	-0.65	-0.72
6	planning skills	0.52	0.60	0.37	-0.12	-0.16	-0.20	-0.36	-0.59	-0.81
7	client communication	0.50	0.30	0.24	-0.05	-0.43	0.02	0.48	-0.63	-0.82
8	horizontal communication	0.28	0.40	0.29	-0.04	-0.23	0.11	-0.21	-0.40	-0.75
9	problem-solving	0.33	0.38	0.30	-0.11	0.26	-0.26	-0.42	-0.29	-0.83
10	checking skills	0.12	0.10	0.21	0.23	0.23	-0.35	-0.19	-0.07	-0.75

Source: *Dickerson and Green (2002), Table 3.*

Notes: *The measures of generic skills each have a mean of zero and a standard deviation of one.*

3.67 A similar breakdown by highest level of education attained and by gender is provided in *Table 3.10*. Most of the non-manual generic skills identified increase monotonically with educational qualifications. This is as would be expected for literacy and numeracy since these are formally tested with educational qualifications, but is perhaps more surprising for some of the other measures of generic skills. The widest variation in generic skills across education is for high-level communication skills.

3.68 *Table 3.10* also reveals that there are only very small differences in the mean levels of literacy skills used by men and women in their jobs, but there are larger and significant differences in numeracy, technical know-how and problem-solving skill utilisation, all of which men use more in their jobs than women. Men also utilise more physical skills than women as expected, but fewer communication skills, with the exception of high-level communication. The latter is undoubtedly related to occupational differences as seen above, and, especially, the fact that women who work part time use lower levels of generic skills.

Table 3.10 Mean levels of generic skills by highest educational level attained and gender

		Highest Education Level Attained						Gender	
	generic skills	No qualification	NVQ Level 1	NVQ Level 2	NVQ Level 3	sub-degree	degree	male	female
1	literacy skills	-0.56	-0.33	-0.08	0.04	0.40	0.48	0.01	-0.01
2	physical skills	0.48	0.40	0.06	0.05	-0.25	-0.64	0.09	-0.12
3	number skills	-0.43	-0.30	-0.09	0.10	0.35	0.35	0.15	-0.16
4	technical know-how	-0.22	-0.01	-0.03	0.17	0.18	-0.03	0.19	-0.20
5	high-level communication	-0.55	-0.35	-0.22	-0.03	0.43	0.72	0.09	-0.11
6	planning skills	-0.56	-0.28	-0.12	0.04	0.40	0.48	0.05	-0.06
7	client communication	-0.43	-0.22	0.00	0.04	0.25	0.28	-0.05	0.06
8	horizontal communication	-0.38	-0.23	-0.04	0.02	0.29	0.27	-0.03	0.03
9	problem-solving	-0.44	-0.19	-0.07	0.10	0.31	0.28	0.12	-0.13
10	checking skills	-0.30	-0.13	0.03	0.12	0.19	0.09	0.07	-0.05

Source: *Dickerson and Green (2002), Table 4.*

Note: *All the gender differences in skills are significantly different from zero at the 1% level with the exception of literacy skills.*

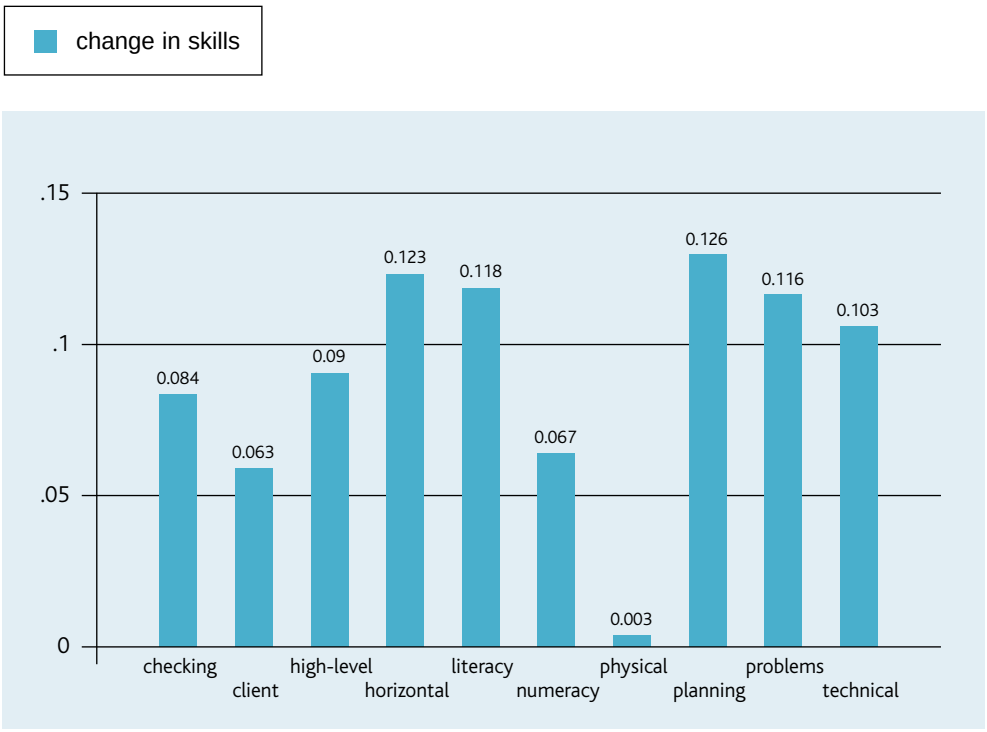
Between 1997 and 2001, there was an increase in the use of all generic skills with the exception of physical skills.

Computing skills are becoming increasingly important and widespread...

3.69 Differences in the utilisation of these generic skills between the two skills surveys are shown in *Figure 3.16*. As can be clearly seen, the evidence is that with the exception of physical skills, the utilisation of all of these skills amongst the employed workforce has grown between 1997 and 2002. Indeed, the increases are all significantly different from zero.

3.70 The Skills Surveys also asked respondents about their use of computing skills. Both intensity and complexity of use were recorded. As shown in *Table 3.11, Panel A*, the proportion reporting that computer use was *essential* in their job increased from just over 30% in 1997 to almost 40% in 2001, an increase of one third, while the proportion reporting that computer use was 'not at all important' fell by one third from 30% to just over 20%. These are large changes given that the surveys were administered only four years apart, signalling an ongoing rapid diffusion of computing technologies.

Figure 3.16 Differences in the Use of Generic Skills Over Time



Source: *Dickerson and Green (2002), Table 5.*

Note: *Indices, see Table 3.8 for details.*

and the complexity of computer utilisation is also increasing.

3.71 For those respondents who reported *some* computer usage, a subsidiary question was asked about the complexity with which computers were used within their jobs. The responses to this question are shown in *Table 3.11, Panel B*. Despite the rapid spread of computer usage to wider sections of the workforce, there is no evidence that the average level of complexity of use is falling. Indeed, there has been an increase in the complexity of computing usage at the less sophisticated end of the range with a shift in the proportion reporting 'straightforward' usage to those reporting 'moderate' usage on the basis of the above scale. At the more advanced end of the range of complexity, there has been little change between the two survey dates. For a detailed descriptive analysis of the growth of computing skills over 1997 to 2001, and of further aspects of computing and internet skills in 2001, see Felstead *et al*. (2002). The association of the growth of computing in Britain with the more general growth in the demand for skills is shown in Green *et al*. (2002).

3.72 Thus the evidence from the two Skills Surveys is that there has been a continued increase in the demand for generic skills in recent years, and that computing skills continue to expand rapidly amongst the workforce in Britain.

Various skills have been shown to attract a premium in the labour market in terms of higher pay.

3.73 Dickerson and Green (2002) also provide estimates of the valuation of these generic and computing skills, in terms of the additional pay that they attract in the labour market. The evidence is that high-level communication skills and computing skills carry significant positive wage premia. Moreover, advanced and complex usages of computers earn a higher premium than more straightforward usage.

3.74 In addition to the national skills surveys, there have been a variety of other employer surveys conducted at sectoral and local level. These are considered in Volume 2 of this *Skills in England 2002*.

Table 3.11 Centrality and Complexity of Computing Usage

A: Importance of using a computer etc.:

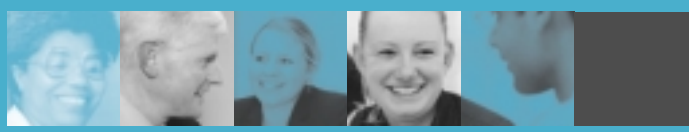
year:	1997 (%)	2001 (%)	Total
essential	30.8	39.7	36.5
very important	14.8	14.8	14.8
fairly important	12.2	13.8	13.3
not very important	11.7	10.5	10.9
not at all important	30.5	21.1	24.5
Number of obs.	*2488*	*4448*	*6937*

B: Complexity of use of computers etc.:

year:	1997 (%)	2001 (%)	Total
Straightforward	38.1	30.6	33.2
Moderate	39.1	45.8	43.5
Complex	17.7	17.2	17.4
Advanced	5.1	6.4	6.0
Number of obs.	*1669*	*3259*	*4928*

Source: *Dickerson and Green (2002), Table 6.*

Chapter 4: The Supply of Skills



Chapter 4

The Supply of Skills

Overview and Summary

4.1 This chapter examines the supply of skills in the workforce and how these differ across various dimensions such as employment status, gender, region and locality, ethnicity and occupation. The most readily measured indicator of the supply of skills is individuals' qualifications. Thus, this chapter examines formal academic and vocational qualifications, as well as training provision. Future skills supply is addressed by examining current participation in education and training, especially amongst young people.

This chapter documents the supply of skills.

4.2 By all available measures, the supply of skills in the workforce is increasing. More workers are qualified, and to higher levels, and a higher proportion of the workforce participates in some form of formal training every year.

The stock of skills is increasing...

4.3 However, there still remains a group of mainly older adults who have no qualifications, and receive little or no workplace training. In the modern workplace, this group is becoming increasingly marginalised. They have a much higher probability of being unemployed, or economically inactive.

4.4 At the other end of the age spectrum, young people are participating in education and training in greater numbers than ever before, and with ever greater success. However, there have been some concerns expressed regarding the actual qualifications achieved - both academic and vocational - and there is a perennial debate regarding the standards being reached. Despite increasing participation, Britain still falls behind her major competitors, especially with regard to intermediate and vocational qualifications.

with greater participation in further and higher education and training.

4.5 Further expansion in the stock of skills is forecast given the targets currently in place for increased participation in further and higher education. An increasing concern has recently been expressed about the subject mix that students are choosing, with a continued move away from more traditional sciences and mathematics toward a greater focus on cultural, leisure and media studies.

These trends are set to continue.

Introduction: Targets and Objectives

4.6 The Leaning and Skills Council established in April 2001 is a unified body which oversees all post-16 education and training in England, with the exception of the university sector. The LSC is responsible for:

The LSC is responsible for all post-16 education and training in England (except Universities).

- further education;
- work-based training and young people;
- workforce development;
- adult and community learning;
- information, advice and guidance for adults; and
- education business links.

Its primary mission is to seek to raise attainment and participation such that, by 2010, young people and adults in England will have the knowledge and productive skills matching the best in the world.

The LSC's targets cover school leavers through to adults, and from basic to more advanced skills.

4.7 The LSC's five key targets for 2004 are outlined in *Table 4.1*. The achievement of these targets and those to be established in the LSC 2002 Corporate Plan is crucially dependent on the continued development of the stock of skills in the workforce, from basic skills such as literacy and numeracy, through vocational qualifications, as well as further increasing the participation of young people in further and higher education.

Table 4.1 Learning and Skills Council Objectives and Targets to 2004

	Key objectives	Targets for 2004:
1	Extend participation in education, learning and training	• 80% of 16–18 year olds in structured learning (2000: 75%) • target for adults to be set in 2002 Corporate Plan
2	Increase engagement of employers in workforce development	• Develop measure of employer engagement in 2002 Corporate Plan
3	Raise achievement of young people	• 85% at level 2 by age 19 (2000: 75%) • 55% at level 3 by age 19 (2000: 51%)
4	Raise achievement of adults	• Raise literacy and numeracy skills of 750,000 adults
		• % of adults at Level 2: target to be set in 2002 Corporate Plan • 52% of adults at level 3 (2000: 47%)
5	Raise quality of education and training and user satisfaction	• Set baselines and targets in 2002 Corporate Plan

Source: *LSC Strategic Framework to 2004, Corporate Plan.*

4.8 This chapter examines the existing qualifications of the workforce in England, the level of participation in higher and further education for young people, and the amount and degree of training taking place in the workforce. It is these measures which will indicate the progress that is being made towards the local LSC's 2004 targets.

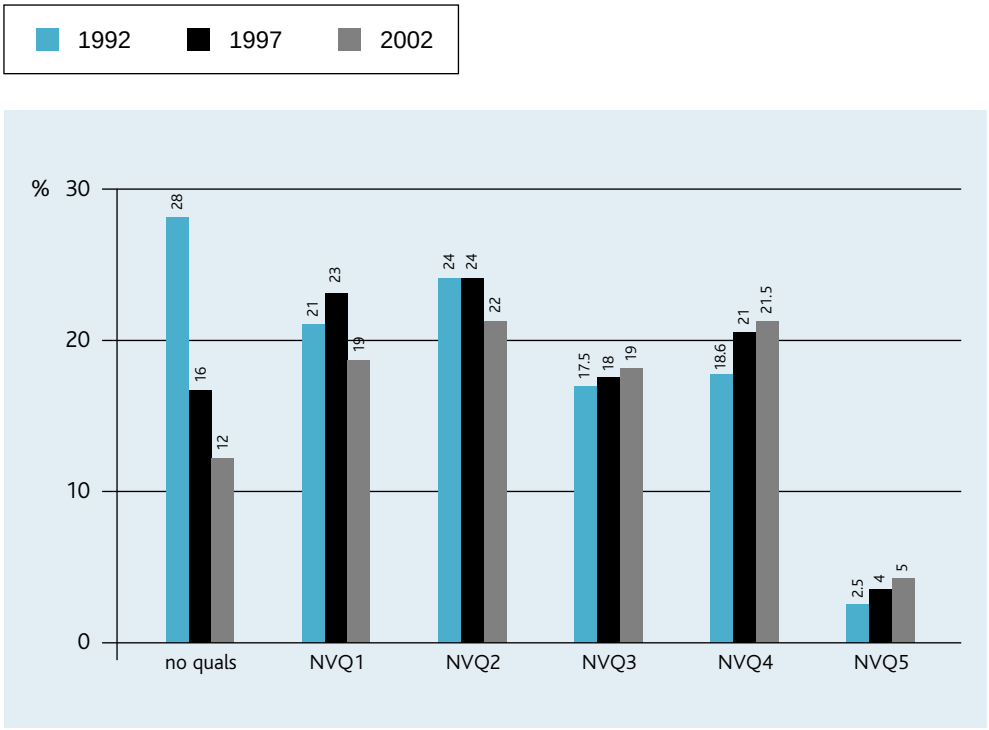
The Supply of Qualifications

4.9 The most direct evidence on the supply of skills can be obtained from examining the supply of qualifications amongst the economically active labour force.

The stock of qualifications in the workforce is increasing due to a cohort effect...

4.10 Using data from the Labour Force Surveys, *Figure 4.1* reports the highest qualification held by the economically active population for 1992, 1997 and 2002. As can be clearly seen, the proportion of the economically active population with no qualifications has fallen significantly over this period, from 28% to just over 12%. In part this is a cohort effect – that is, the result of older and less qualified workers reaching retirement age, and/or leaving the labour force, being replaced by younger, more qualified workers who have recently completed full-time education.

Figure 4.1 Highest Qualification Held by Economically Active Population, England: 1992-2002 (percentage)



Source: *Labour Force Survey, Spring 1992, 1997 and 2002.*

4.11 However, as can be seen from the individual NVQ qualification categories, there has also been a simultaneous shift upwards in the average qualification level of those with some qualifications, with smaller proportions qualified at the lower NVQ levels 1 and 2, and increasing proportions qualified at the higher levels. The significant expansion of the numbers in higher education over the last decade can begin to be seen in the increase in the proportion educated to NVQ level 4, and this will gather momentum in the next decade as more recent graduating cohorts begin to dominate the working age population. There has also been a large increase in the proportion with NVQ level 5 qualifications, which has more than doubled in just the last decade, although these still only represent just over 5% of the economically active population in England.

and also to the growth in accredited learning and training.

4.12 There has been some concern expressed that this upgrading of the stock of qualifications held is leading to credentialism, whereby employers raise their qualification requirements for recruitment to jobs even though the nature of the jobs remains unchanged. Recent survey evidence reported in Felstead *et al*. (2002) suggests that, in general, the qualifications that are required to get a job are indeed useful for actually performing the job. However, there is some evidence to suggest that job demands have not risen by as much as required qualifications over the last 15 years, especially at the lower qualification levels. Nevertheless, at the highest level, where the issue of credentialism is expected to be most apparent, given the relative growth in

the numbers with further education qualifications, there is no significant evidence of this phenomenon.

There is wide variation in the distribution of qualifications...

4.13 The distribution of qualifications across different groups in the workforce varies considerably. *Table 4.2* illustrates some of these differences across a number of dimensions of the workforce, and for different qualification levels.

by employment status,

4.14 Individuals who are unemployed or economically inactive are between two and three times more likely to have no qualifications as compared with those in employment. In contrast, those with high levels of qualifications are much more likely to be in employment than unemployed or economically inactive. Clearly, even low levels of qualifications can considerably increase employment probabilities, with the obvious beneficial consequences for social inclusion.

Table 4.2 Qualifications of the Workforce, England:2002

	No quals	NVQ 1	NVQ 2	NVQ 3	NVQ 4	NVQ 5
Economic status:						
Economically active	12.2	19.8	21.9	19.3	21.5	5.2
In employment	11.6	19.5	21.9	19.6	22.0	5.3
ILO unemployed	22.7	26.3	22.2	14.4	11.8	2.7
Inactive	32.4	19.8	19.0	17.0	10.1	1.7
Total	16.3	19.8	21.3	18.8	19.2	4.5
Age:						
16-24	9.2	20.6	30.1	26.6	12.4	1.1
25-49	9.2	20.7	20.6	18.3	24.9	6.3
50-59	19.2	18.3	20.5	17.4	19.5	5.1
60-64	27.2	15.3	18.8	18.2	16.0	4.5
Gender:						
Male	11.6	17.8	21.1	23.2	20.7	5.5
Female	12.9	22.4	22.9	14.6	22.5	4.8
Ethnicity:						
White	12.0	19.7	22.1	19.7	21.4	5.0
Non-white	13.6	21.4	19.6	15.0	22.3	8.1
Occupation:						
1. Managers and Senior Officials	7.1	14.0	19.8	20.5	31.1	7.4
2. Professional Occupations	0.7	4.0	6.0	8.5	54.9	26.0
3. Associate Prof. & Technical	3.0	11.4	17.7	18.8	43.1	6.0
4. Administrative and Secretarial	7.6	26.8	29.4	19.9	14.8	1.6
5. Skilled Trades Occupations	13.8	17.0	25.3	36.2	7.2	0.5
6. Personal Service Occupations	12.2	24.6	28.9	19.9	13.5	0.9
7. Sales etc.	15.9	26.5	28.8	20.4	7.7	0.6
8. Operatives	22.2	32.9	24.1	16.9	3.3	0.5
9. Elementary Occupations	29.6	28.4	23.3	14.8	3.8	0.2

Source: *Labour Force Survey March-May 2002.*

by age,

4.15 The decomposition by age reveals that it is the very oldest members of the workforce that are disproportionately represented amongst those with no or few qualifications. Of those aged 50-59 years, one in five has no qualifications, while for those 60 or over, this increases to more than one in four. At the opposite end of the spectrum, fewer than one in ten amongst the youngest cohorts have no qualifications.

by gender,

4.16 Women are over represented amongst those with no or few qualifications, and are significantly under represented at NVQ level 3. In part, this may reflect the nature of NVQ level 3 qualifications and the gender segmentation of certain occupations. However, a slightly higher proportion of women than men are qualified at NVQ level 4 and above, and this pattern is set to continue since a higher proportion of women than men now obtain degrees.

by ethnicity

4.17 Inequalities by ethnicity are disguised with the simple white/ non-white comparisons in *Table 4.2*. Indeed, there are far greater differences in qualifications levels between different ethnic groups than between white and non-white groups. Thus, while on average the disparities are small, a finer disaggregation reveals that Chinese members of the workforce have a much higher probability of being qualified to NVQ level 4/5, and also a greater chance of having no qualifications, than other ethnic groups, including whites.

and by occupation.

4.18 The occupational distribution of qualifications reveals a number of interesting features. First, the disparities are exceedingly large – over 80% of professionals are educated to NVQ level 4 or above compared with less than 40% of managers. More than 30% of administrative and secretarial, skilled trades, personal services and sales workers have NVQ level 1 or less. Thus there is an increasing polarisation of skills and this is manifest in the occupational distribution of qualifications. Second, a relatively high proportion of managers have few or no qualifications. Part of the explanation lies in the number of self-employed in low-skill jobs who fall into this category. However, leaving these individuals aside, there still remains a high proportion of managers who have low qualifications levels and there are concerns that this may also be reflected in their having low managerial skills.

Types and Levels of Qualifications

4.19 There is a wide range of academic and vocational qualifications available in the UK, and the categorisation afforded by the NVQ scale, while useful, disguises much of this variation. *Figure 4.2* illustrates the range and distribution between general and vocational qualifications for each of the NVQ categories. As can be seen, vocational qualifications are less prevalent than general and academic qualifications amongst the economically active population.

Academic qualifications

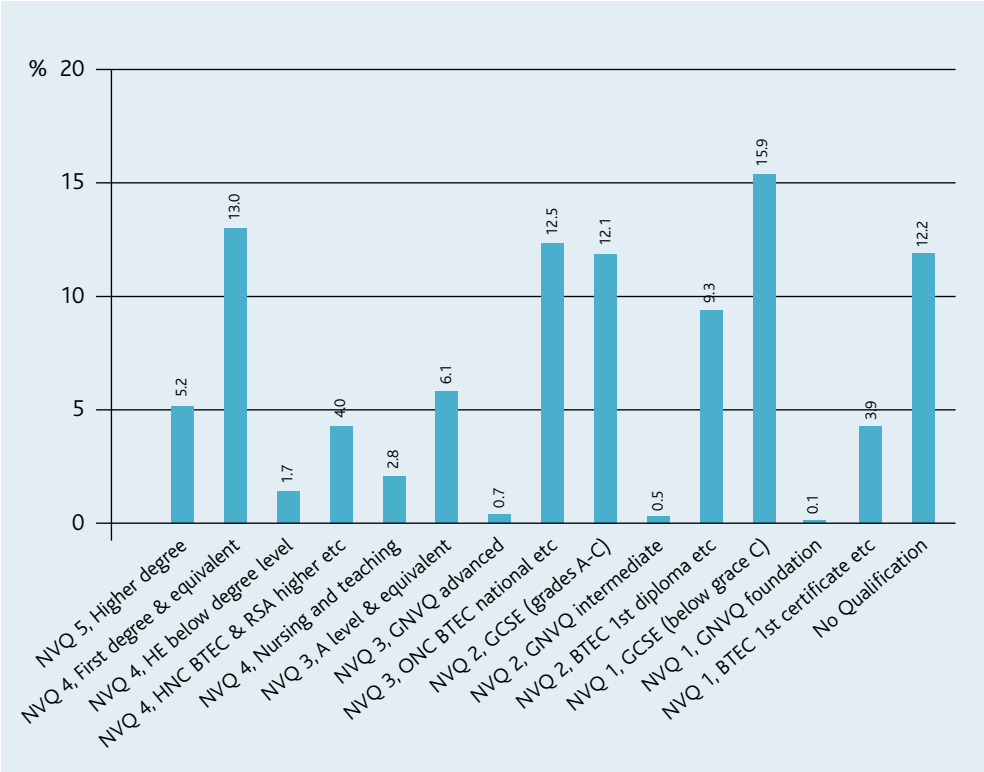
4.20 Academic qualifications for post-compulsory education are mainly A-levels, typically gained at schools and FE colleges, and degrees, attained at HE institutions. As shown below, the proportion of young people aged 16-19 remaining in education has increased over the last decade, although the rate of increase appears to have slowed in recent years. Moreover, achievement at

this level is also increasing, with more students successfully achieving minimum matriculation requirements of 2 A-level passes (NVQ level 3) for continuing on to HE programmes.

Vocational qualifications

4.21 There is a wide range of vocational qualifications, and routes through which they can be achieved. Some, such as GNVQs, focus only on college-based study. Others are workplace-based (NVQs), or based on a mixture of college and workplace based learning. The vast majority of NVQs and GNVQs tend to be concentrated on service sector related areas such as business, leisure, tourism and sales, although a high proportion are achieved in IT. Modern Apprenticeship programmes also come under the umbrella of the NVQ system.

Figure 4.2 Types of Qualifications, England: 2002



Source: *LFS Spring 2002.*

4.22 Concerns have been expressed about the poor relative status and esteem with which vocational qualifications are regarded (see, for example, IoD, 2002). This has been argued to be one factor which has affected efforts to increase the take-up of such qualifications. There is a common misconception that vocational qualifications are in some sense inferior to general or academic qualifications. However, measured by their rate of return, Dearden *et al*. (1999) show that the returns to vocational qualifications are much the same as those to academic qualifications once the differences in time taken to obtain the respective qualifications is taken into account. Hence the labour-market value of both types of qualification would appear to be similar.

There is still a common misconception that vocational qualifications are less valuable. The evidence suggests the returns are comparable to academic ones.

Participation in Further and Higher Education

4.23 The most recent Higher Education Statistics Agency (HESA) figures for 2000/01 show that there were a total of 2.2 million new enrolments on courses leading to higher education (HE) qualifications and credits, 11% of which were at further education (FE) institutions. There were just under a million full-time students studying first degrees in HE and FE institutions in 2000/01 in the UK.

Over 2 million new enrolments took place in HE last year...

4.24 The subject mix of the students currently studying in higher education facilities in the UK in 2000/01 is presented in *Table 4.3*. Most subject areas have increased numerically quite substantially in the last decade or so, reflecting the continued expansion in the numbers in higher education. However, there are one or two notable exceptions, namely physical sciences, and engineering and technology, which have both seen absolute falls in the number of students.

Table 4.3 Subject of Study of Current HE Students (000's and percentage)

Subject	000s	%
Medicine and dentistry	46	2.3
Subjects allied to medicine	233	11.7
Biological sciences	94	4.7
Veterinary science	4	0.2
Agriculture & related subjects	16	0.8
Physical sciences	69	3.5
Mathematical sciences	21	1.0
Computer science	110	5.5
Engineering & technology	130	6.5
Architecture, building & planning	44	2.2
Social, economic & political studies	142	7.1
Law	60	3.0
Business & administrative studies	238	11.9
Librarianship & information science	29	1.4
Languages	96	4.8
Humanities	65	3.2
Creative arts & design	108	5.4
Education	149	7.5
Combined	338	16.9
Total - All subject areas	1991	100

Source: *HESA http://www.hesa.ac.uk/holisdocs/pubinfo/student/subject01.htm.*

reflecting further increased participation in further and higher education.

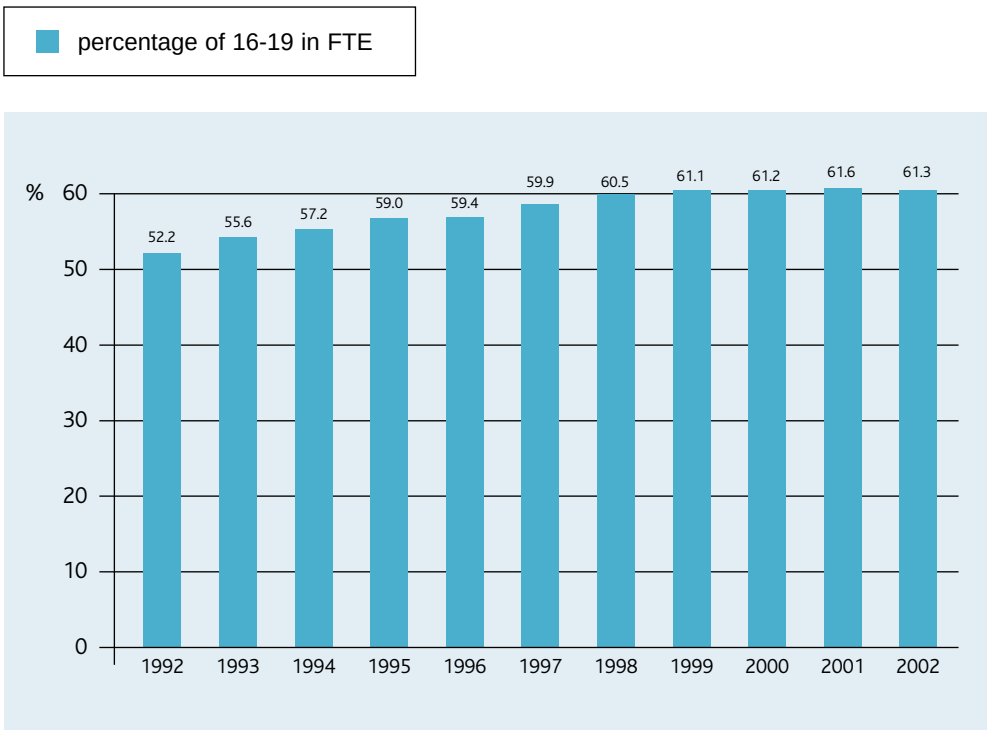
4.25 The rise in participation in full-time education over the last decade is illustrated in *Figure 4.3*. For all those aged 16-19, more than 60% are now engaged in full-time education. This proportion would seem to have stabilised in recent years. It includes a substantial proportion attending tertiary education. Britain now has 33% of 18-20 year olds entering university on a full-time basis. If part-time students, and those aged up to 30 are included, this participation rate is even higher. Coupled with this increase has been a concern that the demand for graduates has failed to match this increase in supply. Mason (1996), for example, reports that almost half of new entrants in the UK financial sector were employed in traditionally 'non-mainstream' graduate jobs. Overall, however, returns to higher education qualifications still remain high and are higher in Britain than many comparable OECD countries.

4.26 However, this debate looks set to continue as the Government's target of a participation rate of 50% for those aged under 30 by 2010 is approached. The IoD (2002) has recently questioned this objective, calling for a greater emphasis on vocational training and a halt to the "proliferation of soft subjects" such as media studies. Widening participation encompasses other objectives such as social inclusion, and there is little evidence yet that there are too many graduates.

4.27 A total of just over 0.5 million students obtained HE qualifications from UK higher education institutions in 2000/01.

4.28 HESA statistics for the destinations of students leaving HE institutions in 2000/01 shows that approximately two-thirds of leavers reported their first destination as employment in 2001. A further fifth went on to further study. Around 5% are unemployed.

Figure 4.3 Participation of all 16-19 Year olds in Full-time Education, England: 1992-2002



Source: *IER estimates from successive Labour Force Surveys, Spring quarters.*

The Supply of Workplace Training

Most employers provide some form of training for their workers...

4.29 The Skill Needs in Britain surveys, and more recently the Learning and Training at Work Surveys, have revealed a fairly high incidence of employer provided training over the 1990s and early 2000s (Spilsbury, 2001). As shown in *Table 4.4*, in 2001, 88% of employers provided either on-the-job or off-the-job training.

Table 4.4 Employer Provision of Training (percentage)

	1999	2000	2001
Off-the-job training	52	59	55
On-the-job training	79	83	78
Both	42	51	45
Either	89	92	88

Source: *Spilsbury (2001), Table 10D.*

but there are concerns that this is not as effective as in other countries.

4.30 Where employers did not provide training, in the majority of cases it was because employees were considered to be already fully trained. In many respects this is not the key question. Given that so many employers provide training the key questions relate to the quality or effectiveness of the training provided, the duration of training, and who receives it. The Learning and Training at Work Survey 2001 can provide some insights into the last two questions but far less so about the first. Yet in many respects it is the quality of training provision that is the critical issue. Commentators such as Keep (1999) suggest that, despite the high level of training provision, it is not effective. The alternative interpretation is that high levels of training are required because of Britain's comparatively poor skillsbase. Britain's relative productivity, as the Treasury have pointed out, is still substantially lower than for some of our main competitors, notably France and Germany. Given its high incidence, if training were effective, the productivity of the UK ought to be catching up with these competitors.

Training provision is widespread across sectors and regions.

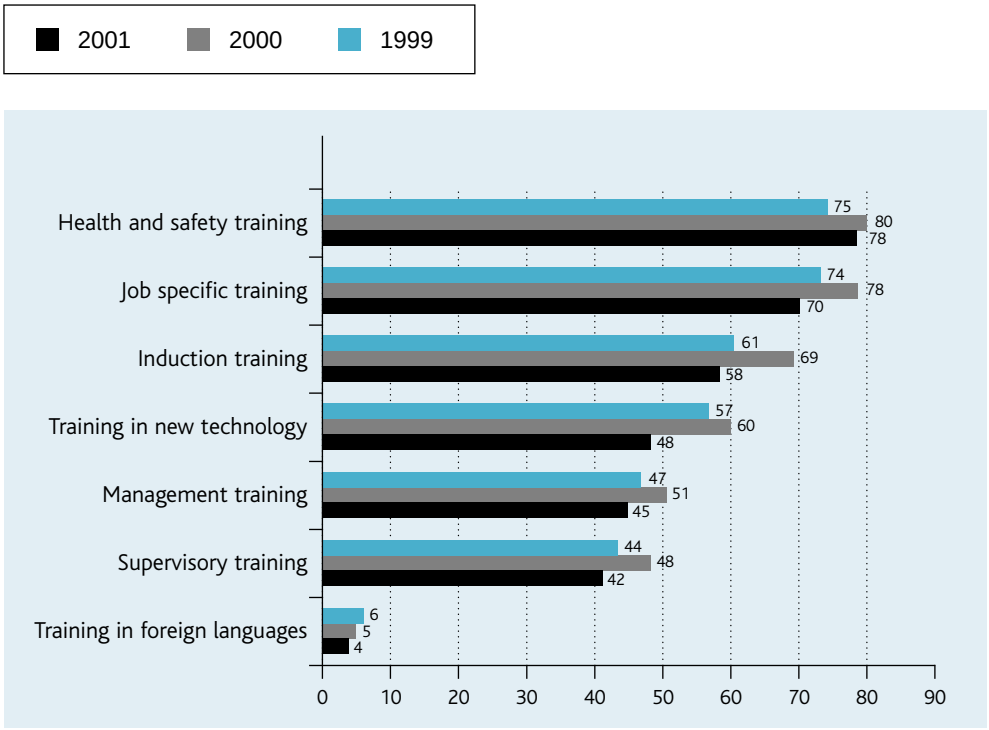
4.31 The Learning and Training at Work 2001 survey provides a detailed quantitative breakdown of where training is being delivered. The key findings to emerge are:

- employers in 'other services' including the public sector were most likely to provide training (92% of establishments providing either on-the-job or off-the-job training) and those in agriculture/mining/construction (84%) were least likely to. In fact, the variation in provision by industry is quite limited. Other evidence shows that it is the public sector that is most likely to provide training (Hogarth *et al*. 2001);
- larger employers are more likely to provide training. All workplaces with 500 or more employees provided either on-the-job or off-the-job training compared to 86% of those with 5-24 employees; and
- there is limited regional variation in training provision. Employers in the North East (93%) and the East of England region (93%) were the most likely to provide either off-the-job or on-the-job training compared to the North West, where employers were least likely to provide training (86%).

Training tends to be of short duration.

4.32 Quality is almost impossible to measure, but the content, accreditation, and duration of training provision gives some indicators. Generally, employer provision of training tends to be of short duration. On average, those employees who had received off-the-job training had obtained 8.2 days of training over the last year – this equates to 2.3 days of training per employee. Typically, off-the-job training was concerned with health and safety, job specific, and induction training as shown in *Figure 4.4*. Just over half of all off-the-job training was accredited. Where employers accredited training, in over half of these cases (52%) it led to an NVQ/SVQ, and in 27% of cases to a higher level qualification such as a degree.

Figure 4.4 Types of Off-the-job-training Provided at the Location in the Last 12 Months



Source: *Spilsbury (2001), Figure 4D.*

Less-skilled, part-time, and those with lower formal qualifications are all likely to receive less workplace training.

4.33 Employers' accounts of training provision are likely to be less reliable where they are asked about the number of employees who have received training or their characteristics. The Labour Force Survey asks individuals whether they have been engaged in formal training over the last 13 weeks. *Table 4.5* reveals how the provision of training is distributed by the characteristics of employees. In *Skills in England* (Campbell *et al.*, 2001), attention was drawn to the unequal distribution of training provision and this finding is revealed once more in *Table 4.5*. Generally speaking, the less skilled (as recorded by occupation), part-time workers, older people, and those with lower level or no qualifications were less likely to have been in receipt of training. Employers may well be able to rationalise the distribution of training (e.g older people are more experienced and therefore less in need of training, those higher up the occupational hierarchy are likely to yield higher returns to the employers' investment in training). Rational though these arguments undoubtedly are, it is also apparent that those with no qualifications or lower level ones, and those working in lower level occupations, have less access to a resource (workplace training) that might well improve their relative position.

Regional Variations in Skills Supply

Regional disparities in the distribution of qualifications are smaller than those by occupation or sector.

4.34 There are disparities in the regional and local supply of skills. *Figure 4.5* illustrates the proportions of the economically active, by region, who achieve NVQ level 3, and NVQ level 4/5. While the precise skills mixture differs between regions, it is clear that, in general, the differences between regions are small as compared to the occupational or sectoral distribution of qualifications. London, the South East and South West have the highest proportions of workers who have achieved at least NVQ level 3, with London having a noticeably higher proportion of those with NVQ levels 4/5 of all the regions. In part, this simply reflects the regional distribution of sectoral employment.

They partly reflect differences in the demand for qualifications as workers move to jobs which are matched to their particular skills.

4.35 Of course, the differences in the distribution of qualifications are greater at the 47 local LSC level than at the regional level. However, they mainly reflect the underlying regional pattern, with local LSCs located in London and the South East tending to have a workforce which is rather more qualified than local LSCs in the North. The extent to which these intra-regional differences in qualification supply are an issue for employers trying to recruit more skilled workers depends on a wide variety of factors. They are also a strong reflection of employers' *demand* for skills as reflected in the sectoral and locational specificity of employment. It is difficult to know to what extent supply or demand factors dominate in the resulting distribution of qualifications. Evidence on the regional distribution of skills shortages, and their relation to vacancies and unemployment rates is provided by Green and Owen (2002).

The future supply of qualifications as recorded in the education and training participation of young people is fairly uniformly distributed regionally.

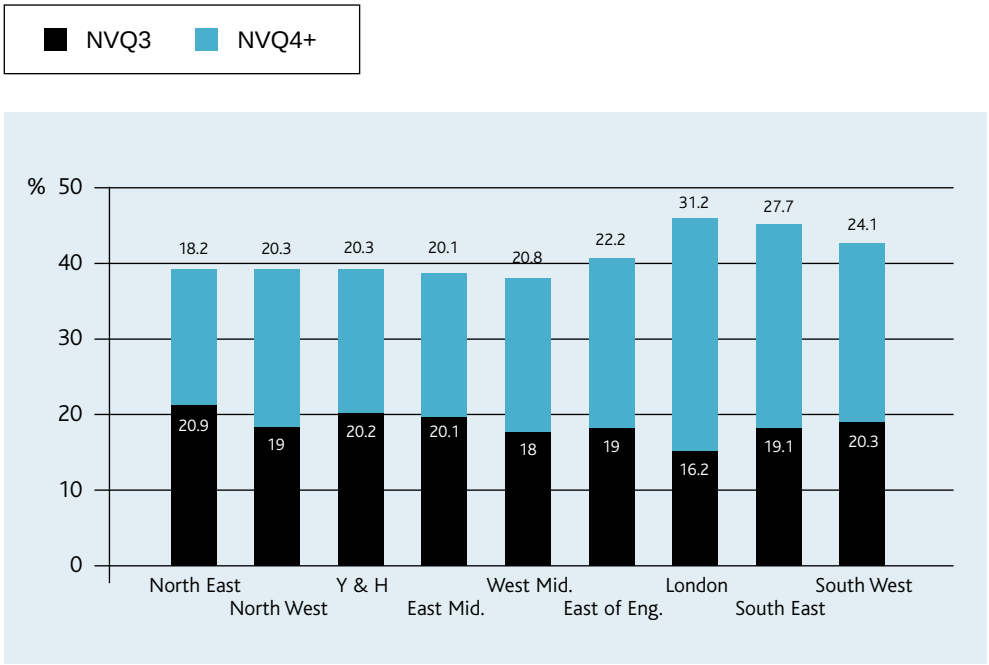
4.36 *Figure 4.6* shows the regional distribution of participation in education and training of young people. There are few, relatively small, differences between regions, with the notable exception of London where a greater proportion of young people are engaged in full-time education than all other regions in England. (However, in part this disparity may reflect the way in which students' residences are classified in the LFS since students in halls of residence are treated as resident at their parents' address, while the remainder are treated as resident in their term-time address even during vacations).

Table 4.5 Percentage of Individuals in Receipt of Training in the Last 13 Weeks

	1995	2002
All	24.1	29.0
By Occupation:		
1. Managers and Senior Officials	26.1	27.5
2. Professional Occupations	43.1	47.0
3. Associate Professional and Technical	33.5	40.4
4. Administrative and Secretarial	24.3	27.6
5. Skilled Trades Occupations	16.4	18.6
6. Personal Service Occupations	26.4	40.7
7. Sales and Customer Service Occupations	16.6	25.1
8. Process, Plant and Machine Operatives	12.4	13.8
9. Elementary Occupations	15.1	16.9
By Full-time/Part-time status:		
Full-time	25.1	29.8
Part-time	19.3	26.4
By Contract Status:		
Permanent	25.9	30.8
Not permanent in some way	27.2	35.0
By Qualifications:		
NVQ 5	41.9	45.2
NVQ 4	40.5	41.5
NVQ 3	23.7	29.0
NVQ 2	23.1	26.8
NVQ 1	20.2	23.5
No qualifications	7.6	10.4
By Age:		
16-24	31.7	40.2
25-49	25.8	30.1
50-59	16.5	22.6
60-64	9.1	13.8

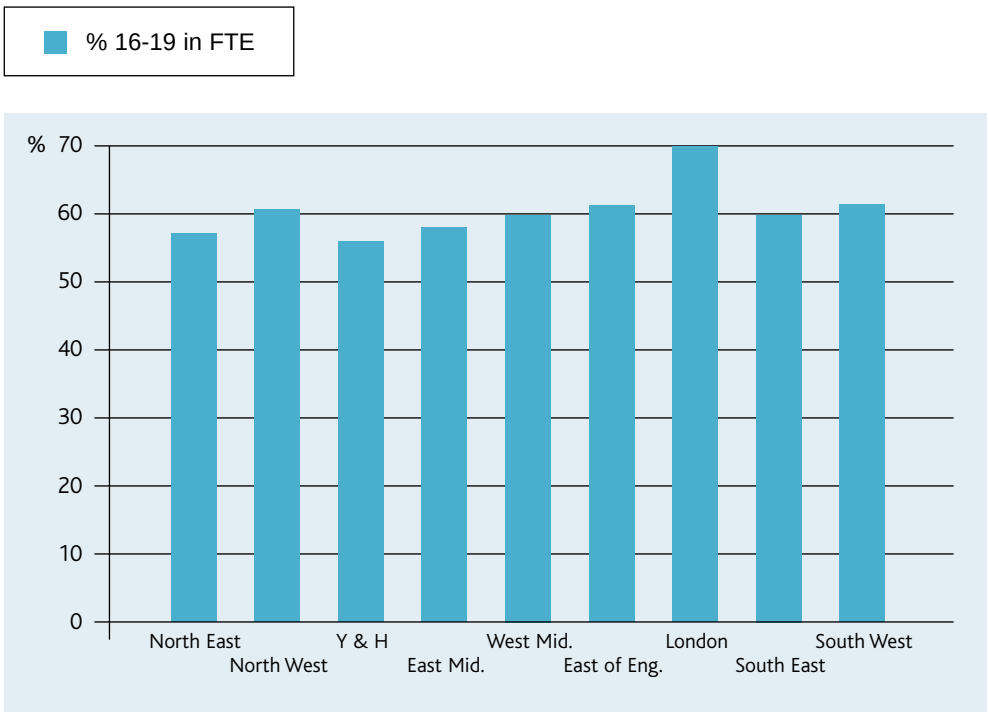
Source: *Labour Force Survey 1995 and 2002*

Figure 4.5 Percentage of Individuals of Working Age with NVQ3 and NVQ4+ by Region



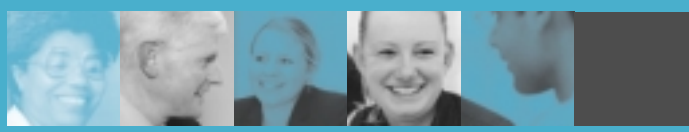
Source: *Labour Force Survey, Spring 2002.*

Figure 4.6 Percentage of Individuals aged 16-19 in Full-time Education by Region



Source: *Labour Force Survey, Spring 2002.*

Chapter 5: Skills Deficiencies and Imbalances



Chapter 5

Skill Deficiencies and Imbalances

Overview and Summary

5.1 This chapter looks at the extent of mismatch between the supply of and the demand for skills. Traditionally debate has focused on what has been referred to as skill shortages. These have been often regarded as a purely cyclical phenomenon. The economics literature has tended to concentrate on dis-equilibrium or equilibrating models, where the principal adjustment is relative wages. The literature suggests that pecuniary and non-pecuniary rewards may not always adjust, or at least not quickly enough, to enable the market to clear. Where wages adjust they may do so far too slowly to move the market back into equilibrium, except in the very long run.

This chapter explores the extent to which the demand for skills is met.

5.2 Available evidence suggests that relatively less weight is attached to higher wage incentives as a means to relieve skill shortages than simplistic views of the labour market might suggest. It is apparent that a rather more sophisticated view of employers' responses to skill shortages is required than one that focuses overly on wages. This includes the capacity of the firm to organise around what would have been hard-to-fill vacancies, the use of new technology, policies designed to retain staff, and so on.

The analysis of skill shortages needs to go beyond relative wages to look at how employers adapt when their skill needs are not met.

5.3 Of course understanding the mismatch between skills demand and supply cannot be wholly divorced from the analysis of wages. The rates of return to education and qualifications and the educational characteristics of the unemployed and economically inactive provide an indication of the skills/qualifications that the labour market rewards or penalises. The chapter begins by addressing this issue before going on to provide detailed information from the Employers Skill Surveys: employers' skill needs, the extent to which these are satisfied, and the consequences for organisational performance where needs are not met.

Nevertheless, rates of return to education and qualifications provides an indication of those skills being rewarded or penalised by the labour market.

5.4 Recent years have seen major changes in England's education and training system on the supply side. A very real risk is attached to increasing supply, without concomitant measures to increase demand. There is a danger that skills may be acquired but remain largely unused. Hence the large amount of speculation relating to over-qualification.

There have been massive changes to the education and training system in England…

5.5 Measuring the extent of over-qualification, arguably, is hampered by the availability of data that directly measure the phenomenon. There is some limited evidence of over-qualification. That said, it must be recognised that this is a rapidly changing area and as the volume of post-compulsory education grows there must be at least the possibility of over-supply occurring.

and the impact of these changes has raised speculation about over-qualification.

5.6 However, the evidence on the private rates of return to education and training points away from a general over-supply of qualifications. All of the evidence to date suggests that additional years of education (and training) are associated with relatively higher wages (by around 5 to 9%). However, this is retrospective and there is a need to monitor ongoing trends closely.

Private rates of return suggest that additional years of education result in relatively higher salaries for individuals.

There may be a mismatch between the needs of employers and the economy generally and current supply patterns.

5.7 One important aspect, which emerges from a review of the evidence, is a mismatch between the supply of people acquiring academic qualifications at degree level (encouraged by government policy aimed at raising educational participation rates) and the demand for high quality vocational skills at a more intermediate level. The latter have been neglected according to both employers' organisations such as the Institute of Directors (IoD, 2002) as well as academic researchers (Layard *et al*. 2002). There is a need to find a better balance between investment in vocational and academic education and training.

Evidence from employers suggests that demand outstrips supply in certain areas, but only to a modest extent.

5.8 In some areas there is evidence that demand is outstripping supply. The fact that there is little evidence of wage-push inflation in the economy suggests that skill-shortages may not be a serious macroeconomic policy concern. Research undertaken by ONS, based on the CBI skill-shortage series of data, indicates that skill shortages, other things being equal, would have to be large to make a noticeable impact on wage levels (Frogner, 2002). Evidence drawn from the Employers Skill Survey series points to recruitment problems being of modest proportions, affecting a relatively small percentage of workplaces and employees. But a number of caveats need to be made to this conclusion.

5.9 However, this view may be too complacent. First, the skills associated with some occupations take years to produce. Hospital doctors come to mind here. However, there is danger of complacency. It is important to continue to monitor future skill needs. Complacency now about the supply of skills needed in the future may lead to problems at a later date. This suggests that it is important to continue to monitor future skill needs.

Moreover, a lack of demand for skills might also provide grounds for concern since there is prima facie evidence of a low skills equilibrium in England.

5.10 Second, there is the possibility of a low skill equilibrium. Put crudely, employers often do not face problems recruiting skilled workers because they are engaged in low value-added, low paid segments of the market that rely on a relatively low skilled workforce. Were they to attempt to compete in more high value added markets this might reveal a serious lack of skills to achieve such objectives.

5.11 What is less clear is the identification of those areas of the economy where such low skill equilibria exist and possibly thrive in the short-term. Large scale survey data, such as those in the Employers Skill Surveys 1999 and 2001 allow analysis at a detailed level of disaggregation. Such data allow analysis, for example, at the local LSC level compared with the situation in England. Without doubt there is compelling evidence both from case studies and other quantitative analysis in support of the low skill equilibrium argument. This issue is covered in more detail in Chapter 7.

Wage Differentials

Wage differentials can provide an indication of the state of the labour market.

5.12 In most markets price can be used as an indicator of supply and demand. Wages, as the price of labour, can fulfil a similar function in labour markets. Trends in occupational wage differentials can therefore be used to assess demand relative to supply for particular skills. A widening of wage differentials may provide evidence of the demand for certain skills growing faster than available supply.

However, employers often chose to adopt alternative approaches to dealing with skill shortages.

5.13 Shortfalls between demand and supply are not always accompanied by such obvious signals. It is clear that, in many labour markets, employers often choose other ways to deal with shortfalls, rather than raising the price that they are prepared to pay. Some employers may be unable to adjust wages in response to changes in the labour market due to collective agreements, pay policy, or public spending constraints. Wages may also be affected by other factors, including the competitive position of individual employers and their profitability.

Long-term trends suggest a growth in demand for high level skills.

5.14 Examination of longer-term trends in pay relativities suggests that certain highly skilled groups (including most professionals and associate professionals as well as many managerial occupations) have experienced relatively rapid earnings growth over the last 25 years. *Tables 5.1* and *5.2* present earnings relative to those for other elementary occupations. Nearly all other occupations have seen pay rises compared with this unskilled group. Most recently, corporate managers and administrators have seen the largest relative increases in earnings amongst both men and women, with health professionals (men) and other professionals, sales representatives (women) also experiencing significant increases (see *Tables 5.1* and *5.2*).

Less skilled workers have seen declines in relative pay.

5.15 Less skilled occupations for men have seen little change or even declines in relative pay. This includes skilled personal service occupations; other sales occupations; drivers and operatives occupations. The range of occupations where relative wage increases have been low for women are fewer but are mainly personal service, other sales, and drivers and operatives.

Table 5.1 Male Average Gross Weekly Earnings in England by Sub-major Occupational Group (Expressed as a Proportion of Earnings of Males in 'Other' Elementary Occupations)

	1975	1980	1985	1990	1995	1998	1999	2000	2001
Corporate Managers Administrators	1.57	1.65	1.85	2.06	2.28	2.35	2.39	2.34	2.51
Managers/Proprietors: Agric/Services	1.02	1.14	1.25	1.30	1.50	1.48	1.48	1.48	1.51
Science/Engineering Professionals	1.53	1.57	1.67	1.77	1.92	1.93	1.91	1.90	1.98
Health Professionals	1.97	2.19	2.53	2.68	2.89	3.05	3.09	3.01	3.42
Teaching Professionals	1.58	1.43	1.58	1.69	1.92	1.83	1.83	1.85	1.94
Other Professional Occupations	1.46	1.57	1.70	1.89	1.95	2.05	2.03	2.04	2.10
Science/Engineering Associate Profs	1.19	1.28	1.45	1.58	1.52	1.57	1.57	1.57	1.62
Health Associate Professionals	1.18	1.20	1.20	1.33	1.42	1.42	1.45	1.44	1.47
Other Associate Prof Occupations	1.45	1.58	1.71	1.97	2.07	2.14	2.17	1.99	2.09
Clerical Occupations	0.92	0.94	1.01	1.03	1.06	1.02	1.02	1.00	1.01
Secretarial Occupations	1.21	1.18	1.23	1.15	1.22	1.10	1.11	1.07	1.05
Skilled Construction Trades	1.04	1.01	1.00	1.04	1.08	1.08	1.10	1.11	1.11
Skilled Engineering Trades	1.16	1.19	1.28	1.31	1.39	1.42	1.39	1.39	1.41
Other Skilled Trades	1.08	1.08	1.10	1.11	1.12	1.13	1.14	1.13	1.13
Protective Service Occupations	1.20	1.35	1.53	1.40	1.42	1.44	1.45	1.46	1.46
Personal Service Occupations	0.93	0.96	0.95	0.90	0.93	0.89	0.88	0.89	0.92
Buyers, Brokers/ Sales Representatives	1.18	1.27	1.41	1.47	1.49	1.51	1.52	1.51	1.59
Other Sales Occupations	0.89	0.89	0.90	0.89	0.84	0.83	0.88	0.87	0.87
Industrial Plant/ Machine Operators, etc	1.09	1.12	1.14	1.15	1.19	1.19	1.16	1.15	1.17
Drivers/Mobile Machine Operators	1.16	1.15	1.18	1.12	1.12	1.13	1.12	1.12	1.13
Other Occupations: Agric/Forestry/Fishing	0.83	0.88	0.84	0.87	0.93	0.90	0.94	0.90	0.91
Other Elementary Occupations	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: *New Earnings Survey*

Note: *SOC 1990 groupings are used as earnings data by occupation are not yet available using SOC 2000.*

Table 5.2 Female Average Gross Weekly Earnings in England by Sub-major Occupational Group (Expressed as a Proportion of Earnings of Females in 'Other' Elementary Occupations)

	1975	1980	1985	1990	1995	1998	1999	2000	2001
Corporate Managers Administrators	1.60	1.70	1.88	2.06	2.35	2.44	2.47	2.40	2.50
Managers/Proprietors: Agric/Services	1.09	1.20	1.31	1.42	1.53	1.53	1.51	1.53	1.56
Science/Engineering Professionals	1.92	1.88	1.88	2.07	2.32	2.29	2.27	2.33	2.40
Health Professionals	2.05	2.38	2.55	2.85	3.39	3.32	3.41	3.36	3.71
Teaching Professionals	1.96	1.73	1.93	2.10	2.35	2.29	2.26	2.29	2.33
Other Professional Occupations	1.86	1.89	1.95	2.32	2.30	2.39	2.41	2.39	2.47
Science/Engineering Associate Profs	1.40	1.48	1.66	1.91	1.87	1.94	1.95	1.93	1.94
Health Associate Professionals	1.50	1.44	1.45	1.72	1.91	1.88	1.86	1.93	1.94
Other Associate Prof Occupations	1.51	1.58	1.73	1.87	2.03	2.00	2.02	1.96	1.97
Clerical Occupations	1.07	1.10	1.18	1.23	1.32	1.29	1.28	1.27	1.27
Secretarial Occupations	1.10	1.15	1.25	1.32	1.40	1.39	1.40	1.40	1.40
Skilled Construction Trades	1.31	1.01	1.01	0.99	1.48	1.32	n/a	n/a	n/a
Skilled Engineering Trades	1.28	1.20	1.30	1.36	1.58	1.65	1.69	1.68	1.59
Other Skilled Trades	0.98	1.01	1.01	1.00	1.08	1.05	1.06	1.09	1.07
Protective Service Occupations	1.57	1.66	1.92	1.92	2.05	1.97	1.99	2.01	1.95
Personal Service Occupations	1.04	1.02	1.03	1.03	1.09	1.03	1.05	1.05	1.04
Buyers, Brokers/ Sales Representatives	1.25	1.44	1.64	1.57	1.78	1.85	1.87	1.81	1.85
Other Sales Occupations	0.82	0.86	0.92	0.93	0.99	1.00	1.01	1.00	0.98
Industrial Plant/ Machine Operators, etc	1.03	1.08	1.11	1.09	1.18	1.17	1.14	1.14	1.13
Drivers/Mobile Machine Operators	1.40	1.35	1.34	1.18	1.18	1.34	1.29	1.32	1.36
Other Occupations: Agric/Forestry/Fishing	0.82	0.89	0.95	0.93	1.01	0.96	n/a	1.05	0.95
Other Elementary Occupations	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: *New Earnings Survey*

Note: *SOC 1990 groupings are used as earnings data by occupation are not yet available using SOC 2000.*

n/a: Too few observations to report estimates.

The Returns to Qualifications

The beneficial effects of education and training can be expressed in terms of rates of return on this investment.

5.16 This section presents a brief overview of evidence on the general returns to education and training and the benefits of obtaining particular qualifications. The effects on employment, productivity and earnings can be expressed in terms of the rate of return to education and training. Typically, rates of return are computed for various qualifications or for the length of time spent in education or on training courses. The rate of return expresses the value of an additional year of education (or the value of a particular qualification) in terms of the associated increase in earnings.

5.17 The consensus seems to be that education does result in higher individual productivity and earnings. The empirical evidence suggests a strong and positive causal link between investment in education and training and earnings. This applies both at the level of the individual and when considering the broader social returns to such investments. There are substantial social as well as private benefits to this kind of activity. The implication is that what is good for the individual at a micro level is also good for society at large at a macro level.

Returns for individuals

A growing body of international evidence suggests that rates of return to investment in additional years of education are typically 5-9% with the UK towards the top of the range.

5.18 There is a large body of international evidence that suggests that investment in education and training is highly beneficial for the individual. For a review see Harmon *et al*. (2002) and Blundell *et al* (1999). On average each additional year of schooling in the UK results in a real return of around 5-9%.

5.19 Comparison across a range of countries shows that the 'returns to schooling' (the number of years spent in full time education) are substantial. In the UK, the estimates are the second highest found in the sample of 16 countries studied. They average around 8% (Harmon and Walker, 2001).

This represents a real and unambiguous positive effect of education on individual's earnings.

5.20 There has been considerable effort to assess whether or not such estimates represent the true cause and effect of education on earnings. This research has addressed the extent to which the estimated benefits might simply represent a return to higher natural ability, as well as various other technical issues, including the possibility that credentials may simply be acting as a signalling device. After extensive examination of these issues the various authors (*op.cit*) conclude that there is a growing consensus that education and training generally does have an unambiguously positive effect on an individual's earnings.

There are also substantial benefits to obtaining particular qualifications…

5.21 The evidence also suggests benefits for the individual to obtaining particular qualifications, especially at higher level, both academic and vocational (Dearden *et al*. 2001). The results typically indicate the increase in earnings over the qualification immediately below, holding all else equal. Whilst the premiums associated with lower level qualifications are generally smaller, the evidence suggests that the benefits to those with lower prior ability are high. The returns to literacy and numeracy are also significant.

5.22 *Table 5.3* summarises some key results from (Dearden *et al*. 2000). These suggest significant benefits from acquiring most academic qualifications, for

both men and women. There are also benefits from gaining various vocational qualifications, such as HNC/HND, ONC/OND, or City & Guilds craft and advanced qualifications.

with substantial premia associated with most academic qualifications...

5.23 The ***premia*** associated with academic qualifications are substantial, ranging from 10-25% for both men and women (generally somewhat higher for the latter). These effects are cumulative. This means that, for example both men and women acquiring A-levels on average earn some 38% more a year than those without any qualifications.

and also vocational ones.

5.24 There are also significant benefits of acquiring NVQ Level 3 vocational qualifications although these are generally lower than for the academic equivalents such as A-levels. For men, on average, acquiring an NVQ level 3, 4 or 5 vocational qualification secures 6% to 9% a year, while for women the corresponding figures are between 1% and 5%.

5.25 It should be emphasised that, as with any other investment, there is no guarantee of a return. Acquisition of qualifications does not guarantee that an individual will receive higher levels of pay. Nevertheless, the empirical evidence suggests that, on average, acquisition of formal qualifications does result in the individual commanding a higher level of earnings.

Table 5.3 Wage Premium (% From Obtaining Qualifications)

Qualification	Wage premia	
	Men	Women
CSE/lower GCSEs	9	5
O level/higher GCSEs	21	19
A-level	17	19
First Degree	28	25
Higher Degree	8	18
Professional qualifications	35	41
Nursing	13	21
Teaching	Nil	27
NVQs Level 1/2	Nil	Nil
BTEC First	Nil	Nil
NVQs Level 3-5	6	5
RSA Higher	4	12
C&G Craft	7	Nil
C&G Advanced	7	Nil
ONC/ONC BTEC National	10	8
HND/HNC	15	9

Source: *Dearden et al. (2001).*

Notes:

(1) The wage premia are additive. For example, a man with O levels/higher GCSEs and A-levels and a First degree will earn 66% more than a man with no qualifications.

(2) The results are based on the estimation of an equation to explain individuals' earnings, which includes controls for age, ethnicity, region, firmsize and public/private sector.

5.26 Taking into account the different lengths of time required to obtain different qualifications, estimates of the ***rates of return*** on each specific investment can be obtained from these data. They need to be treated cautiously as the results are sensitive to the assumptions made about the length of time taken to complete courses of study. These assumptions are especially problematic for some vocational courses.

Rates of return to both academic and higher level vocational qualifications are high.

5.27 The key findings are that the annual return to academic qualifications above GCSE/CSEs are substantial. The returns to higher level vocational qualifications are also high, especially for most professional qualifications. Lower level vocational qualifications, however, do not yield such significant returns. Given the different amounts of time required to obtain the various qualifications, the returns to vocational qualifications at levels 3 and 4 are similar to those for academic qualifications although there are some differences between men and women.

5.28 The rate of return to HNC/HND qualifications compared to first degrees, at least for men, is also comparable. The estimated premia for HNC/HNDs for men range between 6% and 22% giving an annualised rate of return of 5% to 12%. This compares favourably with the estimated rate of return to men gaining first degrees of between 3% and 9%. The results for women show smaller returns. All these estimates are sensitive to assumptions about the time taken to complete the course of study.

Even for low ability groups there are significant benefits...

5.29 The evidence from Dearden *et al*. (2001) does not indicate high rates of return for lower level NVQs (for either gender). But if account is taken of differences in prior ability, there is some evidence that "low ability" individuals can achieve quite good returns at lower NVQ levels. Moreover rates of return for such individuals are even higher for NVQ levels 3 and 4 than for individuals categorised as of "higher ability".

with especially high returns to basic numeracy and literacy.

5.30 Dearden *et al*. (2001) also examine rates of return to literacy and numeracy skills. They found a large positive impact on earnings in respect of both literacy and numeracy at 'entry' level and NVQ level 1. Their results also indicate an important positive effect on the probability of finding and retaining employment. Individuals with level IALS 1 numeracy skills earn around 6-7% more than those with skills below this level (after controlling for qualification level and family background). Such individuals are also around 5 percentage points more likely to be employed. Similar results apply for individuals with IALS level 1 literacy skills. This work on rates of return corroborates the observation in Moser (1999) that the earnings of people with high levels of literacy/numeracy substantially exceed those with low levels.

Existing estimates are, however, retrospective and continued monitoring is necessary to assess the impact of the recent expansion in numbers acquiring higher level qualifications.

5.31 A final caveat is that the estimates of rates of return quoted are essentially retrospective. They reflect past patterns of demand and supply. It remains to be seen if the recent expansion of higher education and the growth in numbers acquiring higher level qualifications will affect the rates of return obtained. The latest evidence on changing patterns of returns over time (McIntosh, 2002) suggests that between 1993 and 2001 there has been very little change. However, this situation needs continual monitoring.

Social rates of return

Social Rates of Return may differ from private ones.

5.32 The discussion so far has focused on the returns to the private individual. Considerable evidence has also been assembled to indicate a wider benefit to society as a whole (see OECD (2001b). The private rates of return presented above relate only to the costs and benefits experienced by the individual undertaking the education or training. In particular, the costs of education typically only involve those elements paid for by the individual (*i.e.* they do not include fees if these were paid by the government). The social rate of return, on the other hand, takes into account all costs and benefits. The private and social returns are generally always different for these reasons. Taking full account of the costs of education would tend (all else equal) to result in the social returns being less than the private ones.

Recognising the significant spillovers, social returns may well exceed the private ones.

5.33 However, this ignores the issue of spill-over effects and externalities from education and training. These include benefits in terms of improved health and reduced crime as well as indirect economic benefits. The latter have been analysed in the so called "new growth theories", which are reviewed in detail by Sienisi and Van Reenan (2002). They also encompass effects at the organisational level (Briscoe and Wilson, 2002). These results, although speculative, suggest that the overall benefit of education and training exceed the sum of the individual parts. Chapter 2 of this *Skills in England* provides a more extensive review of the evidence on the links between skills and productivity and more general economic performance.

There are also returns to vocational training although some caution against an over-optimistic assessment.

5.34 Although much of the research into rates of return focuses on the returns to general education, there has been some more detailed work on the returns to vocational training, Barrett *et al*. (1998), Dearden *et al*. (2000) and OECD (1999). This type of training is often specific to the company involved, in which case it has no additional social benefit. However, in many cases such training has more general applicability. This evidence suggests positive effects on both wages and profits. Keep *et al*. (2002) caution against too much optimism regarding the effectiveness of on-the-job training in Britain which they find is often ineffective.

However, there may be disincentives to be overcome if organisations are to be persuaded to do their bit.

5.35 This possibility raises another important aspect of external benefits which relates to the problem of poaching. If, for example, few firms train, then the trained workers can be offered higher salaries by firms that do not undertake training. The firms which train lose out, and the firms that do not train benefit. This undermines the incentive to train. If, however, all firms can be persuaded to train (to the same standard), then, ignoring differences in types of skills, there is no incentive to poach and, when individuals do move, those lost can be replaced by others of equal skill level. OECD (2001a) notes that various mechanisms have been evolved to reduce the risk of poaching. Layard *et al*. (2002) argue that the state should take some responsibility here and that vocational training should be treated equally with academic education. This may have important implications for the way training undertaken by employers is organised and funded.

Over-Qualification

The dramatic expansion in the supply of qualified people has raised concerns about whether or not they can be absorbed.

5.36 The discussion in Chapter 4 has shown that there has been a considerable increase in the qualification levels of the employed workforce over the last two decades. As discussed there, much of this increase can be attributed to supply side factors. On the other hand the discussion in Chapter 3 has shown that there have been real changes in the nature of the skills required in the typical jobs that individuals have to do. The discussion in this section focuses on the evidence on how the increased supply of qualified people has been absorbed into the labour market and whether or not the jobs they are doing actually require the higher qualifications they have obtained.

5.37 These are important questions, since a growth of qualification attainment beyond actual qualification requirements might represent a significant waste of scarce resources devoted to the supply and acquisition of qualifications.

Some have argued that expansion of higher education may have gone too far.

5.38 Some have argued that there is evidence of over-supply of formal qualifications and that this is leading to 'bumping down' *i.e.* the crowding out of less well qualified workers from particular jobs or the labour market more generally (Borghans and de Grip, 2000). The Institute of Directors (IoD) has also questioned whether or not the Government's focus on increasing participation in higher education is the correct one (IoD, 2002). It argues that many employers would prefer to see more people acquiring useful vocational qualifications at intermediate level and fewer acquiring degrees in subjects with little vocational value.

But a variety of evidence suggests that demand may have outpaced supply increases.

5.39 This section of the chapter therefore examines evidence on whether there is a 'skills surplus' caused by employers not actually requiring or utilising the skills that have been acquired and are available. The evidence presented in Chapter 3 suggests that there is indeed real, required skills upgrading taking place in terms of higher and increasing skill requirements within a wide variety of occupations. A wide variety of indicators and evidence from the demand side suggest increasing skill needs and skill use.

On the other hand there is some evidence of over-supply of some qualifications and an excess demand for those with no qualifications.

5.40 The *Skills Survey 2001* (Felstead *et al*, 2002) provides some further information about the extent to which there is a mismatch between qualifications supplied through the education and training system and demand from employers for those qualifications (*see Table 5.4*). Although crude, they are indicative. In 2001 the key findings relate to people with no qualifications and those with level 3 qualifications. These measures indicate that there is an excess demand for jobs that do not require people to have qualifications, principally because the supply of people with no qualifications in the labour market has been falling away over time. In other words, the number of jobs that require no qualifications from applicants exceeds the number of people without qualifications. In 2001, there was an excess supply for all levels of qualification (Levels 1-4) but it was most marked in relation to Level 3: excess supply of around 2.4 million qualifications. Excess supply of qualifications is to be expected to some extent because of the huge growth in the number of people with qualifications. Employers will take time to adjust work organisation. Nevertheless, the rapid increase in educational attainment has raised questions about 'over-qualification' and 'credentialism'.

Table 5.4 Excess Demand by Qualification Level (excess supply denoted by negative numbers)

	000's	
Qualification level	1986	2001
Level 4	356	-237
Level 3	-1,762	-2,403
Level 2	-255	-1424
Level 1	-606	-598
No qualification	191	3,583

Source: *Based on Table 5.5 Felstead et al. (2002)*

Notes: *Felstead et al. 2002 calculated the imbalance in the supply and demand for qualifications by multiplying the number of people employed by the proportion of employees who reported that they required that qualification to get their job. This is a measure of demand. A measure of supply was obtained from the number of people who reported possessing a qualification. Excess demand was calculated by subtracting supply from demand.*

5.41 The *Skills Survey 2001* compared the qualifications employees possessed compared to the qualifications required to obtain that job (Felstead *et al*, 2002). 'Over qualification' refers to those instances where the employee's qualifications are higher than those required to get the job (based on the respondents' perception of that requirement). There are difficulties attached to this definition of over-qualification that the authors of the Skills Survey point out. For example, the qualifications possessed by an individual may be under-utilised in their current job but may be needed in future, or some people might be constrained by their domestic circumstances from taking a job that makes good use of their qualifications.

The Skills Surveys record a slight increase in over-qualification between 1997 and 2001.

5.42 Comparison of the 1997 and 2001 Skills Surveys reveals that the percentage of individuals who were over-qualified grew from 33% to 37%. According to this evidence, over qualification appears more prevalent amongst those qualified to Levels 2 and 3 where 50% and 48% respectively were over-qualified compared to 28% of those qualified to Level 4 or above. Despite this finding the authors find little evidence of 'credentialism', that is where employers raise the qualification level required to get the job but leave the nature of the job unchanged. In general, around three quarters of employees reported that the qualification required to obtain the job was needed to do the job. That said, between 1997 and 2001 the percentage of employees reporting that level 3 was necessary fell away slightly from 77% to 70%.

Some argue that the balance between academic and vocational qualifications needs to be changed.

5.43 These results appear to be somewhat at odds with the IoD (2002) view that more emphasis is needed on improving qualifications at levels 2 and 3, or the argument by Layard *et al*. (2002) that vocational qualifications need to be given greater status. They can be reconciled, if it is recognised that a key problem is not so much the level of investment in education and training (in terms of length of time spent learning) but the nature of what is being learnt. Finding the correct balance between academic and vocational studies remains

a source of concern. For many commentators, the emphasis is still too much biased towards the former, with the consequence that many young people do not take up more vocational options which might better match their interests and talents, while also better reflecting what employers are looking for in new labour market entrants.

International comparisons suggest that the UK has experienced faster increases in demand than supply for higher level qualifications.

5.44 In contrast to the above evidence, the OECD study (OECD 2001b, pages 162 and 170: Chart C4.2 and *Table 5.2*) shows that the demand for highly qualified persons has grown faster than their supply in nearly all OECD countries and certainly in the UK. This is based upon a comparison of the percentage point increase in the proportion of people with tertiary level (largely degree level) qualifications in the employed population and the percentage point change in the proportion of people with such qualifications in the working age population. While a rather crude indicator, this indicates that demand has been growing faster than supply in the UK over the last few years.

On balance, fears of over-qualification appear to be exaggerated, although the situation requires continuous monitoring.

5.45 There is some evidence of over-qualification as presented in the *Skills Survey 2001*. In general, however, the jobs that people generally do require the qualifications that people have acquired, although the most recent evidence suggests that some of the fears about over-qualification may be realised if present trends continue. Nevertheless, rate of return evidence tends to confirm that, so far, there has not been any indication of demand failing to keep pace with supply increases. The growth in both numbers and utilisation of qualifications needs to be monitored regularly. It also highlights the importance of examining both the supply-side and demand-side of the skills market, including the need for ongoing monitoring of pay and rates of return.

Qualifications and Occupations

Qualifications can be a poor indicator of skill levels...

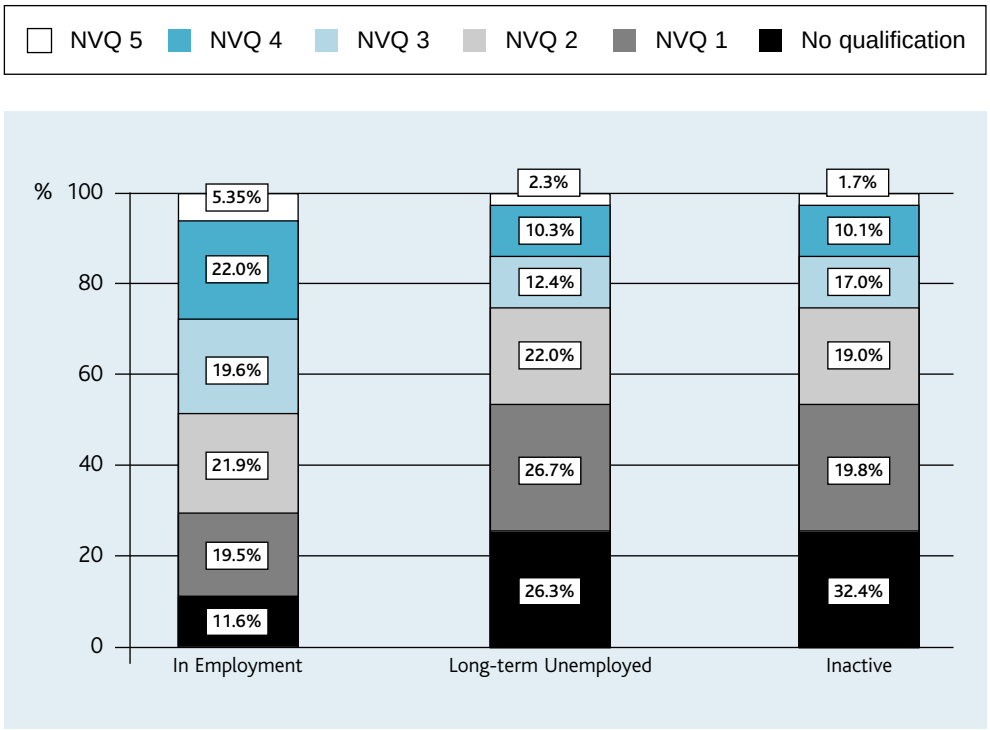
5.46 Whatever the evidence about the extent of over-qualification, and no matter how employers use qualifications in recruitment, the evidence points towards possession of qualifications being an important determinant of an individual being in employment. But one should be wary of using qualifications as a proxy measure of skill, especially non-vocational qualifications. Strictly speaking, possession of a qualification reflects the capacity of an individual to have successfully engaged in a period of structured learning.

but possession of them is strongly related to being in work.

5.47 *Figure 5.1* shows the highest level of qualification held by those in employment, the long-term unemployed (*i.e.* unemployed for six months or more), and the economically inactive. The most striking feature of the data is the percentage with no qualifications in each group. Whereas just under 12% of those in employment have no qualifications, 26% of the long-term unemployed are without qualification, and 32% of the economically inactive.

5.48 The evidence, however, points to the percentage of individuals without qualifications in any of the three categories falling over time. There is a strong cohort effect here. Older people exiting the labour market are more likely to be without qualifications whereas those entering it for the first time, because of changes in the education and qualification systems, are much more likely to possess qualifications.

Figure 5.1 Highest Qualification and Economic Status, March-May 2002
(percentage)



Source: *Labour Force Survey March – May 2002.*

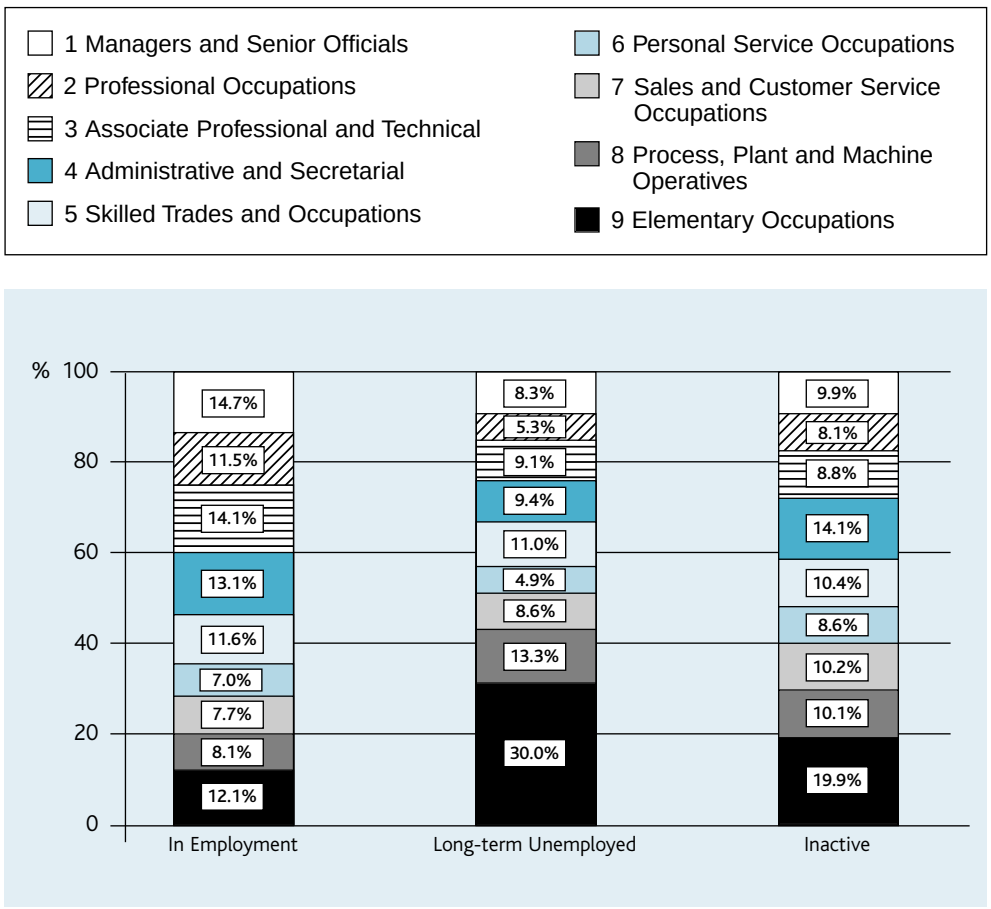
Occupation provides an alternative measure of skill to qualifications.

5.49 Occupation provides an alternative indication of skills possessed by an individual since occupational status is acquired from being in work. Data from *Figure 5.2* indicates clearly that those in lower level occupations are substantially more at risk of being long-term unemployed or out-of-work. For instance, the least skilled occupational group - elementary occupations - comprised 12% of those in employment in 2002, but 30% of the long-term unemployed.

Those in lower level occupations face a greater risk of becoming unemployed.

5.50 It is necessary to add a qualification to the relationship between unemployment and skills possessed. Whilst there is undoubtedly a strong relationship in *Figure 5.2*, it needs to be borne in mind that the factors determining the probability of someone being unemployed are quite complex. Unemployment, and certain forms of economic inactivity, are sometimes related to the manifold disadvantages individuals possess. These disadvantages may not be necessarily skill-related although they may help determine occupational status. In other words non-skill disadvantages may determine (in part) an individual's occupation.

Figure 5.2 Occupation and Economic Status



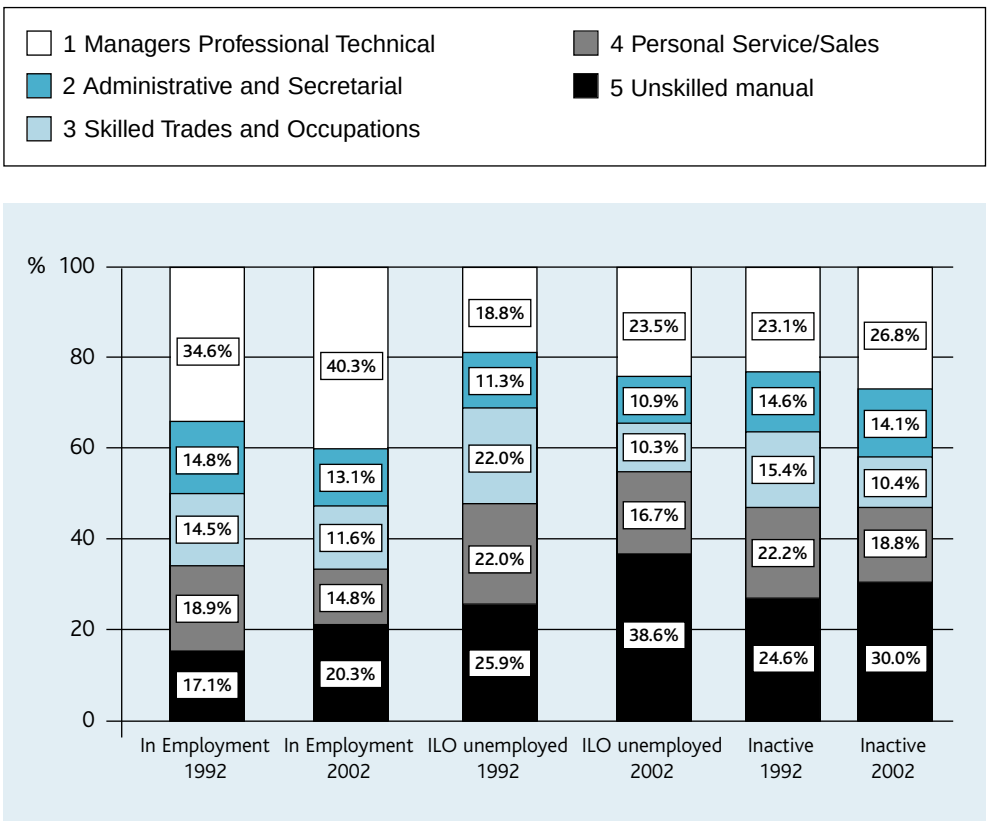
Source: *Labour Force Survey March – May 2002.*

Over time, the less skilled form a smaller share of those in employment, and a larger share of those who are long-term unemployed.

5.51 *Figure 5.3* illustrates how the relationship between occupational status and economic status has changed over the past ten years. The general trend discernible in the data is that of the employed group being comprised increasingly of those in higher level occupations, whilst the unemployed and economically inactive group is increasingly made up of those in lower level occupations.

5.52 *Figure 5.3* suggests that possession of a qualification is a determinant of entering a higher level occupation. Failure to acquire the qualifications that will ease entry into those jobs will result, therefore, other things being equal, not only in an increased probability of being in a low skilled, low paid job, but also an increased probability of being unemployed (at some stage). The risk in 2002 is much greater than it was ten years ago.

Figure 5.3 Occupational Status and Economic Status, 1992-2002



Source: *Labour Force Survey March – May 2002.*

Skill Deficiencies

Employers skill surveys 1999-2002

5.53 The National Skills Task Force recognised the need to differentiate between the skills employers find difficult to recruit from the external labour market, and those that prove difficult to develop, for whatever reason, within the workplace. The former are referred to as external recruitment problems and the latter as internal skill gaps.

5.54 The Employers Skill Survey (ESS) was developed to provide data from a representative cross-section of employers in England about their external recruitment problems and internal skill gaps. ESS was first conducted in 1999 and repeated in 2001 and 2002. The 1999 and 2001 data contained responses from approximately 27,000 workplaces, whilst the 2002 survey sampled around 4,000 workplaces.

The Employers Skills Surveys 1999, 2001, 2002 provide detailed information about employers' skill deficiencies.

5.55 ESS1999 and ESS2002 contained observations from all workplaces with five or more employees. ESS2001 obtained information from all workplaces with one or more employees. This section of the report draws mainly from the ESS2002 survey, published as the *Employers Skill Survey 2002* by the DfES (Hillage *et al*. 2002). But given the wider coverage of the 1999 and 2001 surveys - 27,000 interviews - evidence is also presented from these surveys where relevant.

5.56 ESS1999 and ESS2001 were weighted using the Annual Employment Survey (AES), whereas the 2002 survey was weighted using the Annual Business Inquiry (ABI). To allow comparisons between ESS2001 and ESS2002, Hillage *et al*. (2002) re-weighted ESS2001 using the ABI. This is referred to in tables and charts as '5+ABI'. The main difference, however, between ESS1999/2001 on the one hand and ESS2002 on the other, is the sample size. The overall accuracy of the earlier surveys is substantially greater than the 2002 one.

Definitions and measures of skill deficiencies

ESS provides definitional clarity and consistency.

5.57 ESS1999 and ESS2001 drew a distinction between **hard-to-fill vacancies** (HtFVs), where the respondent defined what was meant by hard-to-fill, and **skill shortage vacancies** (SSVs) where hard-to-fill vacancies were skill related. Those vacancies where at least one of the following causes was cited by the respondent have been defined as SSVs. The relevant causes included:

- low number of applicants with the required skills;
- lack of work experience the company demands; and
- lack of qualifications the company demands.

5.58 In the presentation of the data, the emphasis is upon the discussion of skill-shortage vacancies (SSVs). But it should be noted that the distinction between SSVs and hard-to-fill vacancies (HtFVs) more generally is a fine one. One can never be totally sure that SSVs capture all hard-to-fill vacancies that arise as a consequence of difficulties obtaining skills. The definition of SSVs was an attempt by the researchers involved in the first ESS research programme to separate recruitment problems arising mainly from, say, adequate wage levels, from those that were more directly related to skill. This is exceedingly difficult to achieve and for this reason the commentary also refers to HtFVs more generally where necessary.

It is important to consider both external recruitment problems and internal skill deficiencies.

5.59 It is not just recruitment from the existing labour market that is important here. Information is also required on how well an employer's existing workforce is equipped to meet business objectives. One measure of **internal skill gaps** is the extent to which employers perceive their employees' current skills as insufficient to meet current business objectives. ESS asked respondents to comment on an occupation-by-occupation basis about the extent to which employees were 'fully proficient at their current job'. In order to gauge the extent of skill gaps respondents were asked:

"What proportion of your existing staff at this establishment in (a particular occupation) would you regard as being fully proficient at their current job: all, nearly all, over half, some but under half, very few?"

The responses to this question enable a quantitative estimate of the scale of internal skill gaps.

Extent of skill deficiencies

5.60 CBI data that capture information about the factors likely to limit manufacturing output indicates that just under 20% of employers reported shortages of skilled labour as a cause. Over time the series suggest that current levels of skill-shortages are above those of the early/mid 1990s but below those experienced in the late 1980s (Frogner, 2002).

5.61 In 2002, ESS revealed that 30% of workplaces reported vacancies: around half of these reported that vacancies were hard-to-fill (16% of workplaces), and about one half of HtFVs were SSVs (8% of workplaces) (*see Table 5.5*). The findings for 2002 were broadly in line with those reported in ESS1999 and ESS2001 suggesting little movement against a stable macroeconomic environment.

Around 16% of workplaces had HtFVs and 8% SSVs in 2002.

5.62 The overall number of vacancies implied by these figures is considerably higher than those reported by the Employment Service/Jobcentre. For example in April 2001, there were just under 300,000 vacancies unfilled at Jobcentres and careers offices compared to 532,000 in ESS2001. Survey based estimates of the level of vacancies provide a more comprehensive coverage of vacancies.

5.63 Reporting recruitment problems as a percentage of workplaces can be potentially misleading insofar as those workplaces with many employees may report many more vacancies. It is therefore necessary to report vacancies according to the number of actual vacancies, HtFVs, and SSVs recorded (*see Table 5.5*).

5.64 In 2002 there were approximately 548 thousand vacancies, 246 thousand HtFVs, and 113 thousand SSVs. The number of vacancies fell slightly between 1999 and 2001, from 558 thousand to 532 thousand before rising to near their 1999 level in 2002. A similar pattern emerges with respect to HtFVs, but in relation to SSVs the 2002 figure of 113 thousand is higher than the corresponding levels in 1999 (102 thousand) and 2001 (100 thousand). SSVs appear to be increasing in importance.

In 2002 there were approximately 550 thousand vacancies, 250 thousand HtFVs, and just over 100 thousand SSVs.

5.65 The changes recorded over time needs to be viewed with some caution. The observed changes are of modest proportions, especially so when sampling errors are taken into consideration. Some interpretation of the data is also required. Arguably, the level of recruitment problems is of minor importance since HtFVs correspond to 1.4% of all employment, and SSVs a smaller still percentage at 0.6%. Expressed as a percentage of vacancies, HtFVs appear more important (45%), as do SSVs (21% of vacancies). Before a conclusion is reached about the economic importance of recruitment problems, it is necessary to look at the occupations, industries, and localities that are affected by their incidence, and the impact they have on business or organisational performance.

Although recruitment problems are of modest proportions there is a need to assess their impact on organisational performance, because previous evidence indicates that this can be profound.

Table 5.5 Overall Number of Vacancies

	Per cent of all establishments	Number of vacancies(a) 000's	Vacancies as percentage of employment
2002 **Establishments with 5 or more employees**			
All vacancies	30	548	3.1
Hard-to-fill vacancies	16	246	1.4
Skill-shortage vacancies (b)	8	113	0.6
2001 (5+ ABI) (c) **Establishments with 5 or more employees**			
All vacancies	28	570	3.0
Hard-to-fill vacancies	14	249	1.3
Skill-shortage vacancies	6	100	0.5
2001 **Establishments with 5 or more employees (d)**			
All vacancies	27	532	3.7
Hard-to-fill vacancies	14	232	1.7
Skill-shortage vacancies	6	94	0.8
1999 **Establishments with 5 or more employees**			
All vacancies	32	558	3.2
Hard-to-fill vacancies	16	247	1.4
Skill-shortage vacancies	8	102	0.6

Base: *All establishments.*

Source: *ESS1999 (IER/IFF), ESS2001 (IER/IFF), ESS2002 (IES/MORI).*

Note: *(a) Grossed up survey-based estimates*
(b) Skill-shortage related vacancies are defined as those for which at least one of the following causes of hard-to-fill vacancies was cited: 'low number of applicants with the required skills'; 'lack of work experience the company demands'; 'lack of qualifications the company demands'
(c) Grossed up using the Annual Business Inquiry (ABI) on the same basis as the 2002 survey
(d) This is the corresponding sample to that used in ESS1999 and in 2002.

Skills sought

Technical, communication, customer handling, and team working skills were the most commonly mentioned skills being difficult to obtain in the external labour market

5.66 Where skills are difficult to obtain in the external labour market, information is required about the specific types of skills that prove difficult to recruit. *Table 5.6* indicates the types of skill that employers found difficult to obtain from the external labour market in 2002. 'Other technical/practical skills' (*i.e.* not IT skills), 'communication', 'customer handling', and 'team working' were the most commonly mentioned in relation to either HtFVs or SSVs. Follow up interviews with employers asked what they understood about each of the skills types mentioned in the ESS questionnaire. These interviews indicated that employers did not always distinguish between IT and non-IT technical practical skills.

5.67 As in previous years, the data reveal that employers experienced difficulties locating both technical and more generic skills. Around 28% of all SSVs were related to a combination of both technical and generic skills. One is drawn back to the case studies undertaken as part of ESS1999, which revealed that many employers experienced recruitment problems in their pursuit of *hybrid skills*, that is the recruitment of people with either (a) mixes of distinct technical skills and/or (b) mixes of distinct generic skills (see Hogarth and Wilson, 2001, for a review).

Communications skills much more frequently mentioned as difficult to obtain in 2002.

5.68 Compared to 2001 and 1999, ESS2002 revealed that a lower percentage of SSVs were related to 'other technical/practical skills'. In contrast, in 2002 a much higher share of SSVs were related to 'communication skills' (but just slightly below the 1999 estimate), and 'customer handling'. Similarly, a larger percentage of SSVs were recorded as being related to difficulties obtaining literacy skills.

5.69 Looking at the skills employers report as difficult to obtain, there is the suspicion that employers are essentially looking for the ideal, fully experienced worker who will readily fill the job on offer without much of a settling-in period over which training might be provided. Survey data are not able to fully resolve this issue, but the fact that recruitment problems sometimes arise from a shortage of people with 'experience' is a plausible indication of this. The ESS1999 case studies also provided some indicative evidence of this phenomenon (Hogarth and Wilson, 2001).

Table 5.6 Skills Sought in Connection with Recruitment Problems

Skill Sought	Hard-to-fill vacancies	Skill-shortage related vacancies
Basic computer literacy	5	5
Advanced IT/software	6	7
Other technical/practical	29	36
Communications	31	29
Customer handling	30	29
Team working	24	25
Foreign language	5	3
Problem solving	16	19
Management	15	19
Numeracy	13	13
Literacy	15	17
Driving skills	9	12
Job experience	5	7
Lack of qualifications	6	9
Job specific skills	5	6
Personal attributes (eg reliability, flexibility etc.)	2	*
Don't Know	3	1
Weighted base	*242,690*	*112,735*
Unweighted base	*5,436*	*2,481*

Source: *ESS2002 Hillage et al. 2002 Table 2.14 and 2.15.*

Base: *All hard-to-fill and skill-shortage related vacancies.*

Note: *Multiple responses allowed.*

**indicates a percentage lower than 0.5%.*

Distribution of vacancies by industry

Manufacturing has a disproportionately low share of vacancies compared to its share of total employment.

5.70 *Table 5.7* provides summary information about the distribution of vacancies, HtFVs, and SSVs by industry. Comparing *columns 1* and *4* indicates that construction, and health and social care have disproportionately high shares of HtFVs, whilst manufacturing has a disproportionately low share. *Column 5* provides the density measure of HtFVs, and here one begins to see that recruitment problems are more pronounced in construction, health and social care, and other services. Compared to the average density measure of 1.4%, construction recorded 2.4%, health & social care 2.0%, and other services 2.5%.

Construction and health and social care have the highest shares of SSVs.

5.71 Turning to SSVs, a comparison of *columns 1* and *6* in *Table 5.7* indicates many differences between the share of SSVs and total employment.

Sectors with a disproportionately high share of SSVs:

- construction (12% of all SSVs but only 4% of total employment);
- health and social care (19% versus 12%).

Sectors with a disproportionately low share of SSVs:

- manufacturing (14% of all SSVs compared to 18% of employment);
- wholesale/retail/hospitality (17% versus 23%);
- public administration (3% versus 6%).

5.72 Finally, *column 7* in *Table 5.7* provides the density of SSVs by industry. Compared to the average density of 0.6%, construction recorded the highest density of 1.9%, followed by health and social care at 0.9%. Public administration recorded the lowest SSV density at 0.3%.

Construction and health and social care also have the highest density measures of SSVs.

5.73 Data from ESS2002 suggests considerable change in the distribution of HtFVs and SSVs since 2001. Construction, transport & communications, public administration, education, and health & social care all account for a higher share of SSVs in 2002 than in 2001, whereas the following industries accounted for a smaller share: wholesale/retail/hospitality, and financial & business services (a much lower share). Over a relatively short space of time, 1999-2002, the distribution of SSVs by industry reveals some marked changes that are not readily explained by ESS survey analysis to date and are worthy of further investigation. For example, to what extent has the decline in employment in the IT sector affected the change?

Table 5.7 Summary of Vacancies, Hard-To-Fill Vacancies, and Skill-Shortage Related Vacancies by Industry

	absolute/column						percentages/ratios
	Total employment	**Total unfilled vacancies**	**Total unfilled vacancies as a % of employment**	**Total hard-to-fill vacancies**	**Total hard-to-fill vacancies as a % of employment**	**Total skill-shortage vacancies**	**Total skill-shortage vacancies as a % of employment**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Weighted base	17,735,666	548,301		245,704		112,735	
Unweighted base	619,622	14,363		5,645		2,670	
Percentages							
Agriculture (a)	*	*	2.6	*	1.8	*	!
Manufacturing	18	11	2.0	13	1.0	14	0.5
Construction	4	5	3.9	7	2.4	12	1.9
Wholesale, Retail and Hospitality	23	26	3.6	23	1.4	17	0.5
Transport & Communications	6	7	3.4	7	1.6	8	0.8
Finance & Business Services	18	18	3.2	13	1.0	16	0.6
Public Administration	6	5	2.4	3	0.6	3	0.3
Education	9	6	2.2	8	1.2	8	0.6
Health & Social Care	12	14	3.5	18	2.0	19	0.9
Other Services (a)	4	7	5.1	7	2.5	3	!
Total	100	100	3.1	100	1.4	100	0.6

Base: *As specified at column head.*

Source: *ESS 2002 (IES/MORI); Hillage et al. 2002 Table 2.5.*

Note: *(a) In subsequent tables 'Agriculture' and 'Other Services' are included in the total figures but not shown separately due to the low number of cases. In this table, estimates of agriculture employment came from the Annual Business Inquiry, which does not fully cover the sector.*

** = less than 0.5%; ! = fewer than 25 cases.*

Distribution of vacancies by occupations

5.74 Occupation provides a means of differentiating people's jobs with reference to the types of skill that might be deployed. *Table 5.8* provides an indication of the extent to which recruitment problems are associated with different occupational groups.

5.75 A comparison of *columns 1* and *4* in *Table 5.8* reveals that a disproportionately low share of HtFVs was found in managerial and administrative and secretarial occupations. In contrast, disproportionately high shares were found in associate professional and elementary occupations. The density measure of HtFVs reveals that by far the highest density score was found for elementary occupations (6.3% compared to an average of 1.4%), and the lowest was for managerial occupations (0.4%).

There were relatively few HtFVs for managers, and many for elementary occupations...

5.76 Turning to SSVs, a comparison of *columns 1* and *6* in *Table 5.8* indicates that disproportionately low shares of SSVs relative to employment were found in managerial and administrative & secretarial occupations. The same pattern is described in relation to HtFVs. Disproportionately high shares were found for associate professional, skilled trades, and elementary occupations. It is interesting to note that the ratio between employment share and SSV share for elementary occupations was much lower than was the case for HtFVs, perhaps reflecting the relatively less skilled nature of the work carried out in this occupation. Whilst the differences between skilled trades' share of employment and either vacancies or HtFVs were not large, the difference was much more substantial in relation to SSVs.

and, relatively few SSVs for managers and relatively many for associate professionals, skilled trades, and elementary occupations.

5.77 The density measure of SSVs (*column 7, Table 5.8*) is consistent with that for vacancies and HtFVs, in that elementary occupations scores the highest (1.7% compared to an average of 0.6%). Skilled trades, however, also scores highly with a score of 1.5%. Managers and personal service occupations recorded the lowest density score (0.2% in both instances).

5.78 Compared to 2001 there has been little change in the overall distribution of SSVs by occupation. The main change is the higher percentage of SSVs accounted for by skilled trades (although it is still below its 1999 level in 2002), and a fairly substantial fall in the share of SSVs recorded in relation to sales/customer service staff. With respect to the latter occupation this will be related to the fall in the share of SSVs accounted for by the wholesale/retail/hospitality industry. The increase in the share of SSVs accounted for by skilled trades will be explained, in part, by the increased share of SSVs recorded by construction.

5.79 Recruitment problems are not particularly manifest in relation to managerial occupations (see Bosworth *et al*. 2002), or professionals. In other words, at the highest occupational levels SSVs are being recorded at a relatively low level. Some care is required in interpreting this finding. ESS1999 demonstrated clearly that SSVs amongst managers and professionals had the greatest impact on organisational performance. This illustrates the need to distinguish between the scale of SSVs and their intensity or importance as reflected in their impact on organisational performance. SSVs for managers might be of modest proportions, but their impact can be formidable as evidenced in the ESS1999 case study evidence and in Bosworth *et al*.'s analysis of the 1999 survey data (Bosworth *et al*. 2001).

SSVs appear to be much less of an issue for the higher level occupations. SSVs are particularly acute in skilled trades occupations.

Table 5.8 Summary of Vacancies, Hard-To-Fill Vacancies, and Skill-Shortage Related Vacancies by Occupation

	absolute/column						percentages/ratios
	Total employment (a)	**Total unfilled vacancies**	**Total unfilled vacancies as a % of employment**	**Total hard-to-fill vacancies**	**Total hard-to-fill vacancies as a % of employment**	**Total skill-shortage vacancies (b)**	**Total skill-shortage vacancies as a % of employment**
Weighted base	17,735,666	548,301		245,704		112,735	
Unweighted base	619,622	14,363		5,645		2,670	
Percentages							
Managers/senior officials	13	4	1.1	4	0.4	4	0.2
Professional	16	11	2.0	13	1.1	18	0.7
Associate professional	10	17	5.1	15	2.1	19	1.2
Administrative/secretarial	16	12	2.3	7	0.6	7	0.3
Skilled trades	8	8	3.0	13	2.1	19	1.5
Personal service	6	7	3.6	9	2.0	8	0.8
Sales/customer service	17	19	3.5	15	1.2	6	0.2
Operatives	11	8	2.4	9	1.2	10	0.6
Elementary occupations	3	14	13.2	15	6.3	8	1.7
Total	100	100	3.1	100	1.4	100	0.6

Base: *As specified at column head.*

Source: *ESS 2002 (IES/MORI).*

Note: *(a) Estimated from survey data (Labour Force Survey data unavailable); (b) Skill-shortage vacancies are defined as those for which at least one of the following causes of hard-to-fill vacancies was cited: 'low number of applicants with the required skills'; 'lack of work experience the company demands'; 'lack of qualifications the company demands'.*

Vacancies by size of establishments

Larger workplaces are more likely to report recruitment problems.

5.80 The proportion of employers reporting vacancies, HtFVs, or SSVs increases with size of establishment (see *Table 5.9*). The share of vacancies, HtFVs, and SSVs has changed little between 1999, 2001, and 2002.

Similarly, the larger the workplace the more HtFVs and SSVs they report.

5.81 If attention is focused on SSVs, it is apparent that in larger workplaces SSVs account for a higher share of vacancies than in the smaller ones. In workplaces of any size, however, SSVs correspond to an almost negligible percentage of total employment.

But where SSVs occur in smaller workplaces they constitute a large percentage of the workforce.

5.82 The evidence from ESS2002 and the previous surveys indicates that recruitment problems are disproportionately experienced by larger workplaces. Though smaller workplaces are less likely to report a recruitment problem it needs to be borne in mind that where they occur they may constitute a large share of total employment. An employer with two SSVs and ten staff potentially has a far worse problem than the employer with 10 SSVs but 500 staff. This has implications for the impact of recruitment problems on organisational performance in smaller establishments.

And despite recruitment problems being associated mainly with larger workplaces, micro-workplaces account for a large share of total SSVs.

5.83 ESS2001 included observations about employers with 1-4 employees. The evidence demonstrated that around 3% of these workplaces reported SSVs. But these workplaces account for around 70% of all workplaces, such that even a small percentage of them reporting SSVs can result in a large number of SSVs. In 2001, out of a total of 160,000 SSVs, approximately 64,000 were in establishments with 1-4 employees.

Table 5.9 Distribution of Vacancies, Hard-To-Fill Vacancies, and Skill-Shortage Vacancies by Establishment Size

column percentages/averages/ratios

Number of employees at establishment	5 – 24	25 - 49	50 – 99	100 - 199	200 - 499	500+	All
Vacancies							
% reporting vacancies	25	38	50	63	71	69	30
Total number of vacancies	211,473	72,209	66,776	58,159	72,287	67,396	548,301
Vacancies as a % of employment	4.3	3.4	2.7	2.6	2.7	2.0	3.1
Hard-to fill vacancies							
% reporting hard-to-fill vacancies	13	19	27	32	37	42	16
Total number of hard-to-fill vacancies	110,708	33,404	25,914	25,707	23,265	26,705	245,704
Hard-to-fill vacancies as a % of employment	2.2	1.6	1.1	1.2	0.9	0.8	1.4
Skill-shortage vacancies							
% reporting skill-shortage vacancies	6	10	17	16	22	25	8
Average number of skill-shortage vacancies	0.1	0.2	0.4	0.5	1.4	3.8	0.2
Total skill-shortage vacancies	45,185	17,025	16,482	8,533	13,310	12,199	112,735
Skill-shortage vacancies as a % of employment	0.9	0.8	0.7	0.4	0.5	0.4	0.6
Skill-shortage vacancies as a % of total vacancies	21.4	23.6	24.7	14.7	18.4	18.1	20.6
Weighted base	*461,719*	*69,342*	*38,674*	*18,346*	*9,367*	*3,170*	*600,618*
Unweighted base	*1,865*	*579*	*334*	*483*	*422*	*371*	*4,054*

Base: *All Establishments.*

Source: *ESS2002 (IES/MORI); Hillage et al. (2002) Tables 2.2 and 2.3.*

Regional dimensions to recruitment problems

5.84 There was little regional variation in the percentage of establishments reporting vacancies, HtFVs, or SSVs. The most notable feature of the regional distribution of vacancies is the relatively small share of vacancies or SSVs recorded in London (this in contrast to ESS1999 and 2001 where London accounted for a relatively high share of SSVs). Expressed as percentage of employment London stands out with a relatively low percentage of vacancies, HtFVs, or SSVs.

There was little regional variation in the distribution of vacancies, except that London has recorded a sharp reduction in its share of SSVs.

5.85 Overall, and with the exception of London, there was little regional variation in the extent or incidence of recruitment problems. The regions of England are fairly heterogeneous in their industrial and occupational make-up and it is likely that intra-regional variations are as great as any inter-regional ones. ESS2002, with a sample size of approximately 4,000 cannot possibly provide estimates of the extent or incidence of recruitment problems at a local LSC level. Even ESS2001, with a sample size of around 27,000, runs into problems of statistical reliability when providing results at the local LSC level. But ESS2001 is the largest and most recent data available on recruitment problems and at least provides an indication of recruitment problems at the local LSC level.

Intra-regional variations are likely to be as important as inter-regional ones.

5.86 Green and Owen have provided extensive analysis at the local LSC level based on ESS1999 and ESS2001 (see Green and Owen 2001, 2002, for details). Drawing on their work based on ESS2001, *Table 5.10* provides an indication of the extent of recruitment problems experienced by each of the 47 local LSCs.

Analysis at the local level reveals more variation.

Vacancies at the local LSC level

5.87 In 2001 at the regional scale, there was some evidence for a 'North-South' divide in the incidence of vacancies, with the four southern-most regions of England – the East of England, the South East, London and the South West – recording an incidence of total vacancies, HtFVs, SSVs in excess of the England average. In the West Midlands a greater than national average percentage of establishments reported vacancies of any type and HtFVs, but the proportion reporting SSVs was slightly lower than the England average. In the North East, North West, East Midlands and Yorkshire & The Humber the incidence of all types of vacancies was lower than the England average. Yorkshire & The Humber recorded a smaller percentage of vacancies than any other region.

5.88 *Table 5.10* shows total vacancies, HtFVs, and SSVs expressed as a percentage of employment by local LSC area, (*i.e.* a measure of density). Across England as a whole, total vacancies accounted for 3.74% of employment, HtFVs accounted for 1.73% of employment and SSVs accounted for 0.77% of employment (in 2001). At the *regional scale*, there is clearer evidence again for a 'North-South' divide in the incidence of vacancies on this 'density' measure than on the establishment-based measure. The four southern-most regions of England – the East of England, the South East, London and the South West – record a density of total, hard-to-fill and skill-shortage vacancies in excess of the England average. In the West Midlands, East Midlands, Yorkshire & The Humber, North West and North East, the value on each of the density measures is below the national average. The North East and Yorkshire & The Humber record the lowest densities of total vacancies, HtFVs, and SSVs. The East Midlands displays a similar density of skill-shortage vacancies to these two regions.

Using the density measure of recruitment problems, a north-south divide is once again apparent, with the north revealing a low overall measure of density.

5.89 In many respects the regional and local distribution of HtFVs and SSVs reflects local levels of labour demand. The more buoyant economies in the south have a greater demand for skilled labour which, given the pace of economic and employment growth, is not as readily satisfied as in the rest of the country. But even in areas of strong economic growth there are localities that have a relatively low level of demand for labour (e.g. relatively few SSVs and HtFVs), side by side with areas with high levels of labour demand. Some of this will be an urban-rural divide, but between contiguous urban areas some spill-over of labour demand might have been expected.

Table 5.10 Rankings of Local LSC Areas on Vacancies as a Percentage of Employment

Total Vacancies		Hard-to-fill Vacancies		Skill-Shortage Vacancies	
Hertfordshire	6.39	Hertfordshire	3.74	Hertfordshire	2.77
London East	6.23	Gloucestershire	3.46	Gloucestershire	2.30
Gloucestershire	5.92	Milton Keynes, Oxfordshire and Buckinghamshire	3.41	Cumbria	1.56
Surrey	5.71	London Central	3.20	Wiltshire and Swindon	1.50
London Central	5.55	Surrey	3.03	London Central	1.41
Essex	5.54	Berkshire	2.88	Bournemouth, Dorset & Poole	1.35
London North	5.48	Wiltshire and Swindon	2.75	Hampshire & Isle of Wight	1.31
Milton Keynes, Oxfordshire and Buckinghamshire	5.41	Hampshire & Isle of Wight	2.69	Staffordshire	1.24
Wiltshire and Swindon	5.15	Cambridgeshire	2.61	Sussex	1.12
Berkshire	5.07	Bournemouth, Dorset & Poole	2.49	London East	1.12
Hampshire & Isle of Wight	4.80	Cumbria	2.16	Surrey	1.05
Birmingham & Solihull	4.44	Essex	2.04	Cambridgeshire	0.96
Cambridgeshire	4.22	Sussex	1.95	Lancashire	0.90
Nottinghamshire	4.04	Herefordshire & Worcestershire	1.79	Berkshire	0.83
Sussex	4.04	**England**	**1.73**	Milton Keynes, Oxfordshire and Buckinghamshire	0.83
Bedfordshire & Luton	3.78	London East	1.70	Essex	0.82
Bournemouth, Dorset & Poole	3.77	Birmingham & Solihull	1.67	**England**	**0.77**
England	**3.74**	London North	1.66	Nottinghamshire	0.71
Norfolk	3.40	London South	1.62	Bedfordshire & Luton	0.68
London South	3.26	Norfolk	1.58	Greater Manchester	0.67
Northamptonshire	3.25	Staffordshire	1.57	Birmingham & Solihull	0.67
London West	3.24	Cheshire & Warrington	1.49	Norfolk	0.63
Cheshire & Warrington	3.15	Devon & Cornwall	1.46	Tyne and Wear	0.61
Greater Merseyside	3.14	Bedfordshire & Luton	1.43	London North	0.60

Table 5.10 Rankings of Local LSC Areas on Vacancies as a Percentage of Employment (continued)

Total Vacancies		Hard-to-fill Vacancies		Skill-Shortage Vacancies	
Lincolnshire & Rutland	3.14	London West	1.43	Humberside	0.54
Somerset	3.09	Lancashire	1.35	Herefordshire & Worcestershire	0.53
Devon & Cornwall	3.05	Kent & Medway	1.30	Leicestershire	0.52
Cumbria	3.03	Somerset	1.26	London West	0.50
Staffordshire	2.94	Northamptonshire	1.25	London South	0.49
Coventry & Warwickshire	2.89	Coventry & Warwickshire	1.24	Coventry & Warwickshire	0.47
Tyne and Wear	2.88	Greater Manchester	1.16	The Black Country	0.46
Herefordshire & Worcestershire	2.84	Shropshire	1.15	North Yorkshire	0.43
Kent & Medway	2.84	Nottinghamshire	1.14	Shropshire	0.42
West of England	2.78	West of England	1.11	Devon & Cornwall	0.42
Leicestershire	2.75	Lincolnshire & Rutland	1.11	Kent & Medway	0.42
The Black Country	2.73	West Yorkshire	1.10	Somerset	0.38
West Yorkshire	2.65	Tyne and Wear	1.07	West Yorkshire	0.38
Greater Manchester	2.63	The Black Country	1.06	Tees Valley	0.37
Lancashire	2.54	Suffolk	1.01	Northamptonshire	0.36
County Durham	2.49	Leicestershire	0.99	Greater Merseyside	0.34
South Yorkshire	2.47	County Durham	0.97	Derbyshire	0.34
Shropshire	2.39	North Yorkshire	0.90	County Durham	0.32
Suffolk	2.05	South Yorkshire	0.86	Northumberland	0.25
Humberside	2.01	Humberside	0.82	Suffolk	0.24
North Yorkshire	2.00	Greater Merseyside	0.81	West of England	0.21
Derbyshire	1.82	Tees Valley	0.77	South Yorkshire	0.19
Tees Valley	1.79	Derbyshire	0.75	Cheshire & Warrington	0.19
Northumberland	1.62	Northumberland	0.65	Lincolnshire & Rutland	0.17

Source: *ESS2001, Green and Owen (2002).*

Causes of recruitment problems

5.90 The principal cause of recruitment problems was the low number of applicants with the skills required by the employer. Over time this appears to be growing in importance. It is noticeable that in relation to HtFVs, 35% of these types of vacancy arose because of a low number of applicants with the skills required or a low number of applicants generally (33% of HtFVs).

The main cause of recruitment problems was a lack of applicants with suitable skills.

Responses to recruitment problems

5.91 Where recruitment problems existed, the most common response was to increase recruitment activity either by increasing the amount expended on advertising recruitment (77% of SSVs), or by expanding recruitment channels (72% of SSVs). Strictly, skill-shortages refer to the difficulty filling a job at a given wage. In the light of this, one should not be too surprised to find that the response to just over a half of SSVs and HtFVs was to increase salaries (51% for both types of vacancy). This percentage was slightly lower than that recorded in 2001, but higher than that recorded in 1999.

The main response to recruitment problems was to raise salaries, but slightly less so than in 2001.

5.92 Training may appear to have been of third order importance after increasing recruitment and raising salaries, but it was still a response to a substantial percentage of SSVs. Around 41% of SSVs resulted in employers increasing their trainee programmes and/or increasing their training activity generally (40%). This percentage, however, was substantially down on that recorded in 2001.

Resorting to more training is still an important response to recruitment, but less so than in 2001.

5.93 'Muddling through' was identified as a response by employers in the ESS1999 case studies. ESS2002 also appears to confirm that employers appear to 'make-do' as best they can and struggle on with existing resources. The costs of this approach are likely to be substantial since it may result in various opportunities being foregone.

Many employers 'muddle through' when faced with recruitment problems.

Impact of recruitment problems

5.94 The importance of recruitment problems is gauged ultimately by their impact on organisational performance and, in aggregate, on the economy as a whole. Recruitment problems could be widespread but, if they had little impact on those affected by them, then they would be a widespread phenomenon of little consequence.

The impact of recruitment problems was often profound…

5.95 The main impact of SSVs was meeting customer service standards (53% of SSVs), delays developing new products and services (39%) and increased operating costs (37%). Around 35% of SSVs had resulted in a loss of business or orders – less so than in 2001.

with difficulties meeting standards and loss of business commonly reported by employers.

5.96 The extent of SSVs in the economy in 2002 was of modest proportions, yet where they existed their impact on organisational performance was quite profound, especially so in those instances where it had led to a loss of business or orders. Evidence drawn from the ESS1999 case studies indicates that the impact on loss of business was most pronounced where it related to senior managers and professionals who set the strategic vision for an organisation.

The incidence of skill gaps

Skill gaps reflect the extent to which the workforce are proficient at their jobs.

5.97 Skill deficiencies can arise not just as a consequence of problems recruiting from the external labour market. Developments inside a company can also result in staff not possessing the skills required to meet the business objectives of the organisation. Plausibly, these can arise for a number of reasons, including:

- introduction of new technology that substantially changes the skills required by existing staff in an organisation;
- introduction of organisational change such that employees are required to take on additional responsibilities or tasks;
- lack of training and human resource development;
- a skills inheritance not suited to new ways of working where the workforce is aged and/or there has been little new recruitment; and
- changes in product market strategy such that the organisation changes the type of products or services it delivers to the market.

Proficiency may be challenging in a dynamic marketplace.

5.98 Skill gaps were defined by the researchers involved in the first ESS study in 1999 with respect to the proficiency of existing staff. As part of ESS2002 follow up interviews were conducted with employers to find out what they understood by 'proficiency' (Hillage *et al*, 2002). Some employers appeared to confuse proficiency with performance rather than possession of skills. The distinction is a fine one, but performance may reflect a number of factors other than skill, such as staff motivation, management, etc.

Employers set a high standard when judging proficiency.

5.99 Employers set a high standard in defining someone as proficient at their job such that the employee who was proficient was more than adequate to the tasks required of them. Proficiency was also a dynamic concept insofar as employers tend to report that there was always room for improvement.

Skill gaps may be seen as an organisational weakness, but they may also be a sign of progress. Skill gaps emerge where organisations attempt to improve their product market position.

5.100 There is a tendency to see a lack of proficiency as a weakness. In one sense it is very much a weakness in that employers regard a lack of proficiency as a lack of fitness for purpose. But in another sense it is also a sign of progress. Research undertaken as part of the ESS1999 programme of research suggested that skill gaps emerged in many organisations as they tried to improve their product market position, either by moving to the production of high value-added goods or improving the efficiency with which they produced their existing range of goods or services. Transitional skill gaps emerged as the gap between the skills possessed by the workforce and those required to fulfil the new product market strategy became manifest. The fact that product market strategies are dynamic, indefinite concepts suggests that the transition period will never be completed, because a new product market strategy is almost constantly evolving.

5.101 The extent and incidence of skill gaps is outlined in *Table 5.11*. Evidence about the extent of both broad and narrow definitions of skill gaps is provided. ESS asks about the proficiency of staff on an occupation by occupation basis. Detailed questions about the nature of skills gaps in an organisation is followed up in a maximum of two occupations regardless of

how many occupations are reported as lacking proficiency. The ***broad definition*** refers to either all establishments that reported that at least some of their staff lacked full proficiency or the total number of employees who lacked proficiency. The ***narrow definition*** refers only to those establishments that reported that less than 'nearly all' of their workforce lacked full proficiency. In other words that a substantial percentage of their employees were not fully proficient. Care is required when interpreting findings for the narrow definition since it refers to a sub-group of establishments. When one reports on the number of employees under the narrow definition one is referring to the number of employees lacking full proficiency in those establishments where a substantial percentage of employees lacked full proficiency. For this reason there is some merit in limiting analysis of the narrow definition to an establishment weighted base only.

Around 60% of establishments reported skill gaps in 2002. Around 2 million employees lacked full proficiency.

5.102 In 2002, 60% of establishments reported that at least some staff were not fully proficient (broad measure) and that just over 2 million people lacked full proficiency. This was up on the 50% of establishments who reported this in 2001 but only a little over the 56% of establishments in 1999. The number of staff who lacked full proficiency in 2002 was above the 1.9 million in 2001 and 1999.

5.103 Turning to the narrow definition, 23% of establishments reported that a substantial percentage of their staff lacked full proficiency in 2002, up on the 16% in 2001 and 20% in 1999.

Table 5.11 Initial Estimate of Skill Gaps

	Skill gap measure			
	Establishment based	% of establishments	Employee based	% of employees
ESS2002				
Narrow measure	140,348	23	1,076,997	6
Broad measure	352,856	59	2,166,455	12
ESS2001 (a)				
Narrow measure	95,695	16	782,402	4
Broad measure	303,609	51	1,881,821	10
ESS2001 (b)				
Narrow measure	88,317	16	748,086	4
Broad measure	280,854	50	1,816,751	10
ESS1999				
Narrow measure	104,985	20	860,290	5
Broad measure	307,016	56	1,942,187	11

Base: *All establishments/internal skill gaps.*

Source: *ESS2002 (IES/MORI) Hillage et al. (2002) Table 3.1.*

Notes: *(a) Excluding workplaces with fewer than five employees, and re-weighted using ABI data (i.e. on same basis as ESS2002).*
(b) Excluding workplaces with fewer than five employees and the Agricultural sector, but unadjusted for ABI weighting (i.e. on same basis as ESS1999).

Table 5.12 Occupational Pattern of Internal Skill Gaps

	column percentages
Managers/senior officials	13
Professionals	10
Associate professionals	6
Administrative/secretarial	15
Skilled trades	7
Personal service	7
Sales/customer service	24
Operative	16
Elementary occupations	2
Total	100
Internal skill gaps as % of employment	6
Weighted Base	1,076,999
Unweighted base	40,072

Base: *Internal Skill Gaps: employee based measure.*

Source: *ESS 2002 (IES/MORI); Hillage et al (2002), Table 3.5a.*

Table 5.13 Distribution of Internal Skill Gaps by Industrial Sector

	percentages
Manufacturing	20
Construction	3
Wholesale, Retail and Hospitality	29
Transport and Communications	7
Finance & Business Services	17
Public Admin	4
Education	4
Health & Social Care	11
Total (a)	96
Share of Total Employment	6
Weighted Base	1,076,999
Unweighted	40,072

Base: *Internal Skill Gaps: employee based measure.*

Source: *ESS2002 (IES/MORI); Hillage et al. (2002); Table 3.66.*

Notes: *(a) Does not add to the 100 total as 'Agriculture' and 'Other services' are not shown separately.*

Skill gaps by industry and occupation

Customer service staff accounted for the largest share of all skill gaps, but there are distinct occupational profiles by industry.

5.104 Over all industries customer service staff accounted for the largest occupational share of skill gaps (24%), followed by operatives (16%) and administrative/secretarial staff (15%). Associate professional staff (6%) and elementary occupations (2%) accounted for the smallest shares (*see Table 5.12*).

There has been a substantial increase in the percentage of skill gaps associated with sales/customer care staff.

5.105 Over time there has been little change in the occupational distribution of skill gaps, with two exceptions. The share of skill gaps accounted for by sales/customer care staff has increased substantially since 1999. There has also been a substantial decline in the share accounted for by elementary occupations. The growth in the percentage of skill gaps associated with sales/customer service staff is worth investigating, especially since it is matched by a fall in the number of recruitment problems associated with this occupation.

Most skill gaps were in manufacturing and wholesale/retail/ hospitality.

5.106 *Table 5.13* shows how skill gaps are distributed across industry. From this table it can be seen that manufacturing (20%) and wholesale/retail/ hospitality (29%) accounted for most skill gaps. In contrast, construction (3%), public administration (4%), and education (4%) accounted for the smallest shares of skill gaps. This is in contrast to the problem of recruitment difficulties, where construction (in particular) accounts for much larger shares of the reported vacancies and skill shortage vacancies (see paragraphs 5.70 and 5.73 above).

Skill gaps and establishment size

5.107 *Table 5.14* shows the percentage of establishment in each employee size band that reported skill gaps *(column 1)*, the distribution of skill gaps across size bands *(column 2)*, and the density of skill gaps *(column 3)*.

Large workplaces are more likely to report skill gaps.

5.108 Generally, it was the larger employers who were more likely to report skill gaps – 21% of establishments with 5-24 employees reported skill gaps, compared to 33% of those with 500 or more employees. Skill gaps themselves appear to be concentrated in the smallest and largest establishments: 25% of all skill gaps were in establishments with 5-24 employees and 22% were in those establishments with 500 or more employees. The density of skill gaps increases with size of establishment, from 5.5% in workplaces with 5-24 employees rising to 7.1% in those with 500 or more employees.

Table 5.14 Skill Gaps and Size of Establishments

	Percentage of establishments reporting skill gaps in each size band (%)	Distribution of skill gaps across size bands (%)	Skill gaps as a percentage of employment (%)
Number of employees	(1)	(2)	(3)
5-24	21	25	5.5
25-49	28	12	5.8
50-99	32	12	5.5
100-199	34	13	6.1
200-499	36	16	6.6
500+	33	22	7.1
Total	23	100	6.1

Source: *ESS2002 (IES/MORI).*

Since 1999, larger establishments have increasingly accounted for a larger share of skill gaps.

5.109 Between 2001 and 2002 there has been little significant change in the distribution of skill gaps by size of workplace. The main difference is between 1999 on the one hand, and 2001 and 2002 on the other. In 1999 the largest establishments accounted for a substantially smaller share of skill gaps than in 2001 and 2002.

Skill gaps: regional and local dimensions

Little regional variation in the distribution of skill gaps is evident.

5.110 There was little variation in the percentage of establishments reporting skill gaps in any of the regions, except the relatively low percentage of employers in the East of England region stating they had skill gaps. The largest share of skill gaps was to be found in London (18%) and the lowest share the North East. Yorkshire and The Humber recorded the highest density of skill gaps (8.0%) and the North East the lowest (5.2%). There has been little change in the regional distribution of skill gaps compared to ESS1999 or ESS2001. Again the situation of London is intriguing, given the low share of recruitment problems recorded in the capital.

5.111 ESS2001 allows results to be disaggregated by local LSC area, and it is on these data that *Tables 5.15* is based. The most prominent finding in *Table 5.15* is the degree of intra-regional variation. If one takes the North East as an example, Tyne and Wear (LSC) expresses a-level of skill gaps (broad measure) close to the average for England. To the immediate south of this LSC, LSC Durham recorded 37% of establishments with skill gaps, and to the north of the Tyne and Wear, Northumberland (LSC) recorded a mere 18% of establishments with skill gaps. If there were a strong regional or geographical effect one would expect to see some clustering at a regional level, but this is not the case.

Table 5.15 Incidence of Skill Gaps by Local LSC Areas

Code	Area	% Establishments reporting skill gaps (broad definition)	% Establishments reporting skill gaps (narrow definition)
	North West		
1	Cumbria	12.6	3.1
2	Greater Merseyside	31.8	6.3
3	Lancashire	37.6	10.5
4	Cheshire & Warrington	21.5	8.1
5	Greater Manchester	30.0	4.3
	North East		
10	Tyne and Wear	22.9	8.0
11	County Durham	37.0	15.9
12	Tees Valley	30.4	7.8
13	Northumberland	18.2	6.6
	West Midlands		
20	Birmingham & Solihull	24.3	10.9
21	Staffordshire	18.5	7.5
22	Shropshire	31.7	7.9
23	Herefordshire & Worcestershire	23.1	8.3
24	The Black Country	40.4	4.9
25	Coventry & Warwickshire	21.4	6.2
	Yorkshire and The Humber		
30	North Yorkshire	17.0	3.4
31	South Yorkshire	32.6	9.4
32	West Yorkshire	28.6	7.3
33	Humberside	22.8	5.3
	East Midlands		
40	Lincolnshire & Rutland	26.4	7.7
41	Northamptonshire	24.2	10.4
42	Leicestershire	26.0	8.9
43	Derbyshire	18.6	8.1
44	Nottinghamshire	17.4	8.4
	East of England		
50	Bedfordshire & Luton	27.1	4.8
51	Essex	23.1	5.3
52	Cambridgeshire	27.6	5.5
53	Hertfordshire	18.8	6.5
54	Norfolk	25.1	7.8
55	Suffolk	35.1	7.6
	London		
60	London Central	16.1	4.1
61	London North	13.5	3.7
62	London East	18.2	5.2
63	London West	34.5	14.3
64	London South	19.4	5.2

Table 5.15 Incidence of Skill Gaps by Local LSC Areas (continued)

Code	Area	% Establishments reporting skill gaps (broad definition)	% Establishments reporting skill gaps (narrow definition)
	South East		
70	Surrey	28.3	8.2
71	Sussex	21.8	4.5
72	Milton keynes, Oxfordshire and Buckinghamshire	26.3	5.4
73	Kent & Medway	21.2	4.7
74	Hampshire & Isle of Wight	18.5	6.8
75	Berkshire	32.8	10.8
	South West		
80	Devon & Cornwall	25.7	8.9
81	Somerset	14.5	7.0
82	Gloucestershire	24.9	13.2
83	Bournemouth, Dorset & Poole	27.7	11.4
84	Wiltshire and Swindon	29.4	10.2
85	West of England	40.2	10.2
	ENGLAND	**22.9**	**6.9**

Source: *ESS2001 (IER/IFF).*

Skills sought in relation to skill gaps

Communication skills were most likely to give rise to a skills gap.

5.112 So far the discussion has been mainly about the location (by occupation, industry, region) of skill gaps, but there is also a need to know about the type of skill need in the existing workforce that give rise to skill gaps. The survey asked more detailed questions of up to two of the occupations in which internal skill gaps were identified by respondents. The main area of skill deficiency reported by the sample of employers among their existing employees was communication skills, mentioned in relation to 61% of skill gaps overall. There is resonance with SSVs here that were also reported substantially in relation to communication skills. For each occupation, however, where a skill gap was reported a wide range of skills was associated with that skill gap.

5.113 Over time there have been large changes in the reporting of skills sought in relation to skill gaps. Compared to either ESS2001 or ESS1999, employers were more likely to report that any of the skills mentioned were related to the skill gaps they experienced in 2002. A possible interpretation of this is that skills required in a job are becoming more multi-faceted, with the result that employers report a growing number of skill types in relation to their skill gaps. As a consequence, the nature of skill gaps has become more complex. But because the changes reported over a short space of time are quite large, caution is required in ascribing too much importance to them.

Causes and responses to skill gaps

Staff lacking relevant experience was the main cause of skill gaps.

5.114 Where employers reported the existence of skill gaps, detailed information was collected for just two of the occupations reported as exhibiting skill gaps. The most commonly reported reason for the existence of skill gaps was that of staff lacking relevant experience (60% of all skill gaps recorded this as one of their causes), followed by staff lacking motivation, and a failure by the company to train and develop staff (both 40%).

The most common response to skill gaps was to provide more training.

5.115 By far the most common response to the existence of skill gaps was to provide more training (83% of skill gaps had this response). Expanding training programmes (59%) and changing working practices (56%) were also commonly recorded.

Impact of skill gaps

The impact of skill gaps on organisational performance was substantial leading to difficulties meeting quality standards or losing business to competitors.

5.116 The data reveal that the impact of skill gaps could be quite severe. Although the most typically reported impact was that of difficulties meeting customer service standards (57%) or difficulties meeting quality standards (54%), a substantial percentage of skill gaps also resulted in loss of business or orders (30%), or delays developing new products or services.

The impact of skill gaps on organisational change is growing worse.

5.117 Compared to ESS1999 and ESS2001, the impact of skill gaps on customer service standards, quality standards, increased operating costs, and difficulties introducing organisational change have been getting worse. In conclusion, the evidence points to the impact of skill gaps on organisational performance worsening over time.

Maintaining full proficiency

Most establishments reported no difficulty in maintaining the full proficiency of their staff. But where they did face a barrier it related to the difficulty of providing training.

5.118 All establishments were asked about the barriers they faced maintaining the full proficiency of their staff. Most recorded that they faced no barrier (60%). Where barriers were reported they related to training: lack of time for training, lack of cover for training, or lack of funding for training.

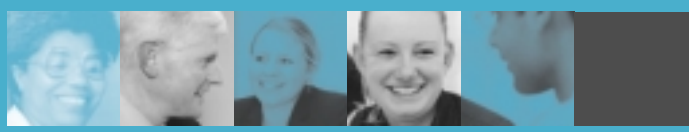
Latent skill gaps

5.119 The much more detailed information available from ESS1999 enables an exploration of the idea of latent skill gaps in the English economy. The concept of latent skill gaps is linked to the idea of a low skill equilibrium. Put simply, better performing organisations are more likely to set challenging product market strategies that demand higher skilled people to bring them to realisation. The latent skill gap is the gap in skill requirements between better and poorer performing establishments operating in the same market. Those establishments that have performed less well may not be aware of the skills they require to move into higher value added markets. Econometric evidence suggested that the extent of latent skill gaps was quite substantial (Bosworth *et al*, 2001) and case study evidence has provided some further intriguing evidence (Hogarth and Wilson, 2001). The econometric and case study evidence revealed that those organisations operating in higher value-added markets were more likely to report problems with the proficiency of their staff, because they were striving to continually achieve better performance. But even in these organisations, skills (and training) are often

perceived of as second or third order importance. Product market strategies were not always translated into human resource plans until such time as the gap between skills required and skills available became manifest.

5.120 Understanding how the skills equilibrium can be ratcheted upwards is dependent upon understanding the relationship between product market strategy and skill needs. Despite a wealth of case study evidence, the nature of the relationship between product market strategy, productivity, and skill needs is only beginning to be fully understood.

Chapter 6: Future Skill Needs



Chapter 6

Future Skill Needs

Overview and Summary

6.1 The previous chapters have examined recent and current trends in skills demand and supplies. This chapter peers into the future, attempting to assess what skills are likely to be required over the coming decade and how this might match up against supply. The main focus is upon what employers' requirements are likely to be and how these are influenced by changes in the economy and the labour market. However, the chapter also considers supply-side developments, the implications for the balance of supply and demand, and skill deficiencies.

This chapter peers into the future and describes how the demand for skill is expected to change.

6.2 The chapter draws upon a variety of different sources. These include the detailed quantitative employment projections conducted at national level as well as a rich array of studies carried out by or on behalf of various sectoral and local organisations concerned with skills.

It draws on a variety of different sources...

6.3 It begins by providing an overview of the projections of occupations and qualifications at national level, produced by The University of Warwick, Institute for Employment Research (IER) on behalf of the Department for Education and Skills (Wilson 2001a, 2001b). Although it is now over two years since these were undertaken, the broad trends identified there are still relevant. The present review provides a brief summary of the key findings. Readers are referred to the original source documents for full details of the extensive results produced and an explanation of the sources and methods used. The source documents, together with more detailed results, are also available on the DfES Skillsbase website (http://skillsbase.dfes.gov.uk/). In contrast to the *Skills in England 2001*, the discussion is now focused just upon England rather than the whole of the UK.

including the detailed quantitative employment projections produced by IER.

6.4 The discussion begins with a brief overview of changes in the macro economy and the implications of these for the labour market and the demand for skills. It summarises expected changes in the economy at national level and how this impacts on employment in general. It then focuses on trends in occupational structure in some detail. The importance of considering replacement demand as opposed to simply focusing on changes in the level of employment is emphasised. Changes in qualification requirements as well as possible changes in the demand for generic skills are also considered. It then turns to consideration of the supply of qualifications and skills, concluding with an assessment of the priorities in terms of the balance between supply and demand.

The macroeconomic context for the projections has changed since they were undertaken although the main messages remain unchanged.

6.5 This information is complemented by a summary of some of the key findings from the work of the newly formed Sector Skills Councils and other sectoral organisations, many of which have undertaken research to assess future skill needs for their own sectors. While these studies often highlight sector specific concerns, it is also clear that there are a number of issues and problems that are common across sectors. The chapter focuses on the problems and issues

These results are complemented with an overview of evidence from research conducted by sectoral bodies...

as well as local and regional organisations.

for particular sectors, based on the evidence from the various sectoral bodies. However, it attempts to highlight common themes as well as sector specific concerns.

6.6 Considerable progress has been made in recent years in assessing skills needs at a more local level. The chapter concludes with a review of evidence from research carried out by or on behalf of various local bodies. The newly formed local arms of the Learning and Skills Council, as well as their predecessors the Training and Enterprise Councils (TECs), have also been charged with developing forward-looking assessments of future skill needs. The results of their work are also summarised here, along with evidence from other bodies such as the Regional Development Agencies (RDAs).

The evidence suggests that major structural change will continue...

6.7 The evidence reported in this chapter suggests that the scale and nature of expected future skill needs will be a great challenge for Government and public agencies, as well as for individuals and employers. Major structural changes involving the continued decline in manufacturing and primary sector employment and the rapid expansion of employment in various service industries will be a key driving force. Considerable changes in the occupational structure are expected, with related moves to an increasingly feminised and part-time employment structure. In turn these changes will require new skills and qualifications from the workforce.

increasing the demand for many high level occupations.

6.8 The occupational structure of employment is projected to continue to change in favour of professional, associate professional and technical personal service, and certain managerial occupations. Some of the most rapid growth is anticipated for caring personal services, business and public service associate professionals, teaching, research and science/technology professionals, and corporate managers. Together, these occupations are expected to account for 85% of the expected net increase in employment over the next decade. Job losses are anticipated amongst secretarial, skilled metal and electrical trades, process, plant and machine operatives and elementary occupations which are clerical and service related.

However, replacement demands are also important...

6.9 The projected net change in employment (expansion demand) tells only a part of the story. It is crucial to recognise that there will be many job openings and important education and training requirements for many occupations where employment levels are expected to fall. These arise because of the need to 'replace' the existing skills that will be 'lost' as a result of retirements and other aspects of the normal process of labour turnover. The scale of replacement demand substantially outstrips the scale of expansion demand by a factor of more than five to one. This varies across occupations and sectors but even where substantial job losses are projected, the replacement demand elements are usually more than sufficient to offset this. It is essential, therefore, for employers, education and training providers, and public agencies to recognise the different characteristics and requirements of these two different components of future skill needs.

6.10 Some occupations are projected to experience rapid growth in both expansion and replacement demand elements. Employers recruiting these occupational groups will face stiff competition and may need to work with providers as well as engaging themselves in training and recruitment activities in order to ensure that their needs are met. However, somewhat paradoxically, it may be those areas where employment is expected to decline where employers will face the greatest challenge. While many employers may be laying off workers and expansion demand might be modest if not declining, meeting replacement demands for those organisations which are continuing in operation can be problematic. The fact that these types of jobs are in decline can discourage new entrants as well as those displaced from other companies. Meeting such needs can be especially challenging from the point of view of both employers and education and training providers.

and there will be problems in meeting the skill needs in both rapidly growing and declining occupations.

6.11 Changes in the occupational structure will also drive up skill demands reflected in formal qualifications required. The occupations projected to grow fastest are those with high proportions of qualified people typically employed, while those expected to decline tend to have low shares of qualified people. These changes are expected to be reinforced over the medium term.

The demand for formal qualifications will also increase...

6.12 Analysis of likely changes in 'generic' key and other skill requirements, also suggest important changes. Verbal skills (especially among managers), numerical skills (especially among clerical and secretarial occupations), planning skills (especially amongst sales occupations) and communication skills (especially amongst managers) are all projected to increase in importance. 'Key' skills such as problem solving, team working, and computing are increasing significantly in many occupations. Changes in autonomy (closeness of supervision) and training and learning time needed to obtain and effectively discharge a job are also expected to increase in importance. Education courses and programmes need to reflect the increasing value placed upon such skills by employers.

as well as the need for key generic and other work based skills.

6.13 Although there are many features in common, there are also substantial regional variations in the pattern of expected future skill needs. This reflects the relative economic strengths of the regions and their particular economic structures. The specific skill needs **in each region** need to be compared with likely availability. This will require significant variations in provision in different regions. There is a wide range of substantial variations in regional patterns of growth and decline in employment across a wide range of occupations. These major variations have implications for developments in the supply of skills required at the regional level, with providers needing to be fully aware of the regional 'peculiarities' of likely trends in occupational structure.

Although there are many common patterns across regions, particular economic structures mean that demands vary significantly.

6.14 An important issue here is that some regions (or at least parts of regions) seem to be stuck in a vicious circle of economic decline, deprivation, disadvantage, lack of investment in skills and other kinds of capital. It is a moot point whether purely supply side policies to promote the availability of skills can break this circle. Measures to promote demand may also be crucial.

The fastest growth in demand is expected to be for particular occupations in the Southern regions of England.

6.15 The growth in total employment levels is expected to continue to favour the South East, South West and East of England regions. Particularly strong growth is expected in the demand for managers in the South East and East of England; for professionals in London and the South East; for associate professional and technical occupations in the South East, East of England and South West; and for administrative, clerical and secretarial occupations in the West and East Midlands; for personal service occupations in the Midlands and the East of England; and for sales and customer service occupations in the South West.

The growth in skill demands will vary across regions.

6.16 The likely future balance of levels of qualifications that will be demanded across the regions varies considerably. In relation to NVQ level 4 and 5 or equivalent, the increases are fastest in London, the South East and the East regions; in relation to NVQ level 3 or equivalent, they are expected to grow fastest in the South East and South West; and with regard to NVQ level 2 or equivalent, the fastest growth in demand is expected in the East of England and South West. At the same time there are likely to be substantial reductions across all regions in jobs that require no qualifications and most especially in the West Midlands, North West and North East.

6.17 Projecting the supply of skills in terms of occupations or key/generic skills is very difficult. Most forecasts therefore focus on qualifications and at an aggregate level.

6.18 Demogaphic considerations suggest a downturn in numbers acquiring formal qualifications but this is expected to be more than offset by increases in educational participation rates. Flows of people acquiring qualifications are projected to continue to rise. The impact of this on the stocks of people holding qualifications will be to see further significant increases.

Substantial growth is expected in the supply of those with formal qualifications, especially at NVQ levels 4 and 5.

6.19 Given the focus on highest qualifications held, the main growth will be at NVQ levels 4 and 5. Numbers with **highest** qualifications at NVQ levels 2 and 3 will not increase much although the overall numbers holding these qualifications will increase significantly. The numbers with no formal qualifications at all will shrink to around 2 million (mainly older people).

6.20 Surveys of employers suggest that they anticipate the main problems in the future will be in terms of various key and generic skills including communication, customer handling, teamworking and management skills. IT skills were also emphasised in the context of the expected growth in e-commerce.

Macroeconomic Trends

Macroeconomic circumstances have changed since the detailed employment projections were constructed.

6.21 Since the employment projections were undertaken for DfES in 2000/2001 much has changed. The events of 11th September, 2001, with consequent effects on the US and world economies have undoubtedly had at least a short term impact. Events closer to home, such as the foot and mouth crisis, while less dramatic in many respects, have had significant effects on particular sectors and localities.

There have also been important changes to the historical data base.

6.22 There have also been important changes in the way that employment is measured. Since the employment projections were undertaken ONS has introduced the new Annual Business Inquiry to replace the Annual Employment Survey. This has resulted in almost a million additional jobs being identified. While this does not necessarily affect the underlying trends identified in the projections it does have important implications for the levels of employment in various areas. However, the pattern of change in employment by sector, region and occupation is not expected to change substantially.

6.23 Since the detailed employment projections were produced in 2000/2001 a great deal of new information has become available relating to the macroeconomic situation. While the detailed employment forecasts have not been updated, the main features of the latest Cambridge Econometrics (CE) view of macroeconomic employment prospects which underlie the more detailed projections can be examined, noting some implications for the detailed projections presented below.

However, the latest overall macroeconomic scenario is not very different from that used to generate the detailed employment projections.

6.24 Despite these changes, Gross Domestic Product (GDP) and Gross Value Added (GVA) are projected to display similar long-term growth rates of approximately 2-2.5% pa over the next decade and a half. Continued low inflation among the major OECD countries is assumed. Sterling is expected to maintain a stable value against the Euro. The projections are based around an assumption of a modest acceleration in public expenditure growth. The main tax rates are assumed fixed.

General labour market prospects also remain very similar...

6.25 General labour market prospects also remain much the same. The key features of the most recent projections produced by Cambridge Econometrics (2002a and b) are as follows:

- the long-term rate of employment growth is expected to be maintained at between 0.4 and 0.5% pa;
- between 2000 and 2015 there are now expected to be almost two million additional jobs created ;
- just over two-thirds of the additional jobs are expected to be taken by women and most will be part-time in nature; and
- the level of unemployment is expected to remain stable increasing slightly over the longer term. For most people unemployment will be a transitory experience, although some will suffer long term unemployment.

and the revised projections of output by sector also remain broadly unchanged.

6.26 The revised prospects for key sectors in the latest macroeconomic forecasts by Cambridge Econometrics, (2002a and b) to 2015 are as follows:

- mining, electricity, gas and water are expected to display the weakest growth;
- manufacturing output growth is forecast now to grow somewhat more slowly, averaging just under 1.75% pa - underpinned by high growth in technology and R&D-related industries, while textiles, clothing & leather and metals are weaker performers;

- transport & communications output is forecast to grow by over 4% pa - with communications displaying the strongest growth of any services outside of computing;
- financial & business services are expected to grow by around 3% pa over the longer term; and
- non-marketed services output is forecast to grow by around 2% pa.

These are all very similar to the prospects expected when the detailed employment projections were carried out.

The prospects for employment change by industry are for job losses in manufacturing and gains in services.

6.27 Employment prospects to 2015 in the latest CE projections are as follows:

- the primary sector (including agriculture, mining and utilities) is expected to continue to experience significant job losses, but losses are projected to slow after 2005;
- the long-term decline in employment in manufacturing is expected to continue; with a loss of over 120 thousand jobs a year between 2000 and 2005. Thereafter job losses slow to around 60 thousand per annum;
- construction is projected to maintain fairly stable employment between 2000 and 2015;
- employment in the distribution, hotels and transport sector, and communications is not expected to change much between 2000 and 2015. There is some growth in distribution, hotels & catering. The pace of increase is expected to slow substantially after 2003 especially in transport and communications;
- employment in other marketed services is forecast to increase by between 100 and 140 thousand a year between 2000 and 2015, with all industry groups within the sector contributing to growth; and
- there is a projected increase in the number of jobs in non-marketed services, of over 100 thousand a year between 2000 and 2005, slowing to around 20 thousand thereafter.

These are broadly similar to those when the detailed employment projections were undertaken.

6.28 At the more detailed level, within manufacturing:

- engineering is the largest contributor to job loss;
- metals & mineral products and textiles & clothing display the largest percentage job losses; amongst other services;
- rapid increases are projected in professional services;
- banking & business services and other services are forecast to see more modest increases in non marketed services;
- all of the projected employment growth is accounted for by health & education services; and

- public administration and defence is forecast to see small declines in employment.

6.29 In the latest projections changes in the industrial composition of employment are expected to have significant implications for various other aspects of employment structure. In particular:

Changing patterns of employment by status and gender are also expected to be similar...

- the decline of employment in manufacturing and primary sectors has resulted in the loss of many full-time jobs, traditionally held by men; and
- the growth of jobs in the service sector has created more opportunities for women, particularly those wanting to work part-time.

6.30 Female employment is now expected to grow by around 1.6 million over the period to 2015, while male employment is projected to increase by just 300 thousand. The share of self-employment is projected to decline in the latest projections, although this rises in some sectors, offset by declines elsewhere, especially in the construction sector, and in transport & distribution. This contrasts with the detailed employment projections where a more stable level was projected.

although self-employment is now expected to decline.

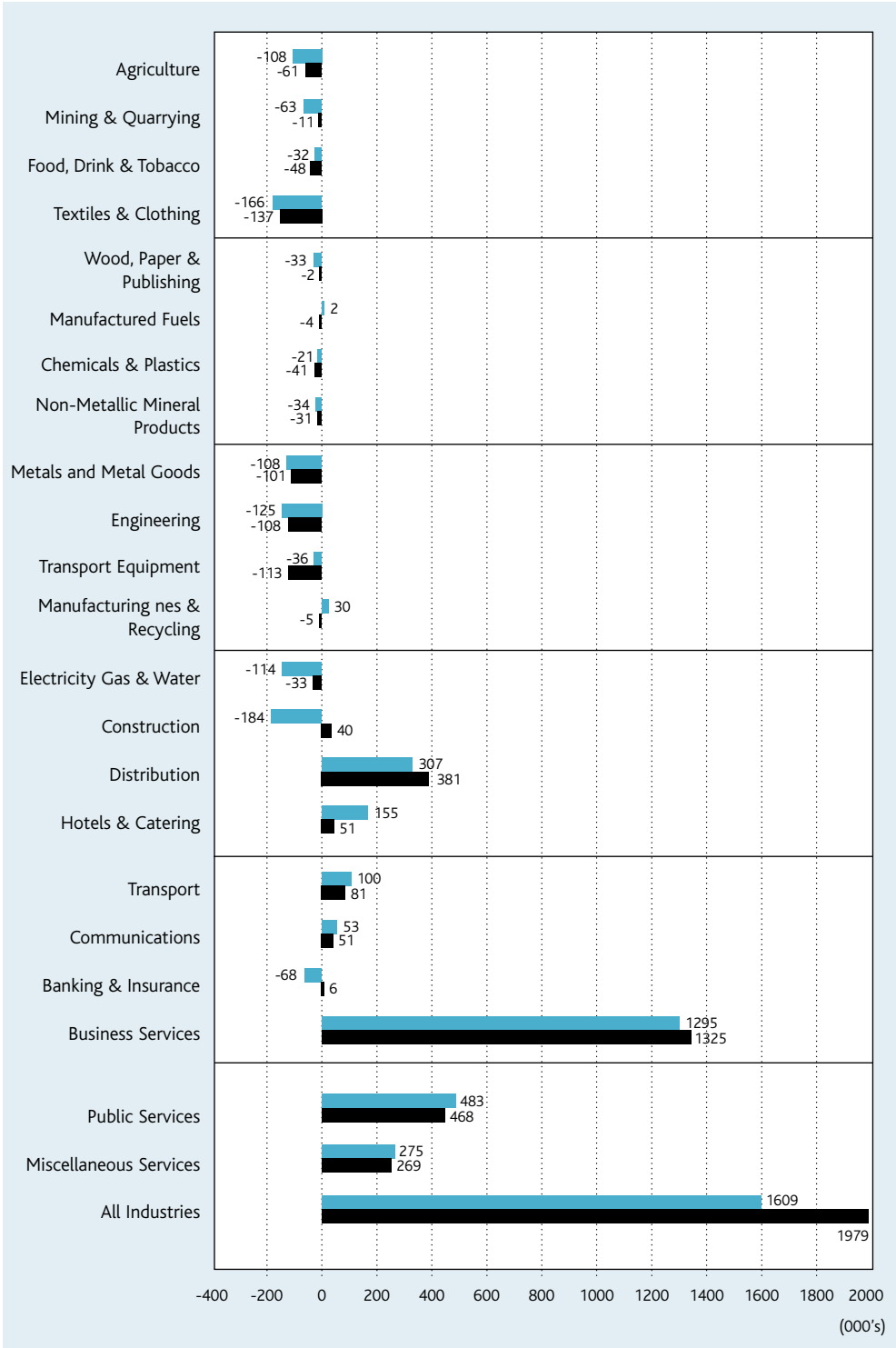
Changes in Employment Structure

6.31 As noted in Chapter 3, changes in the 'sectoral' composition of employment are a key driver of the changing pattern of demand for skills. Significant changes in the sectoral structure of employment in the UK are expected to take place over the next few years (*see Table 6.1*). Over the next decade most forecasters anticipate that employment in the primary and manufacturing sectors will continue its downward trend. In contrast, continued growth is expected in many parts of the service sector, especially in business and other services, non-marketed services and distribution. The most recent projections by CE suggest a similar pattern. If anything manufacturing employment is now expected to decline more rapidly, while growth in some services (especially health and education services) is now expected to be rather rapid.

Sectoral changes will be key drivers for the future demand for skills.

6.32 A much more detailed picture of the changes expected and how these compare with recent historical experience is shown in *Figure 6.1*. The importance of business services as a source of additional jobs is clear although other parts of the service sector are also expected to make a contribution. Primary, manufacturing industries and utilities present a consistent picture of continued decline in employment levels.

Figure 6.1 Historical and Projected Changes in Employment by Detailed Sector: England (000's)



Source: *Based on Wilson (2001a).*

Table 6.1 Expected Future Changes in Employment in England by Broad Sector: 1999-2010

	Change in Nos. Employed 1999-2010 (in 000's)	% Share of Employment in 2010
Primary	-104	1.8
Manufacturing	-590	12.1
Construction	40	6.0
Distribution	565	28.4
Business and other services	1601	29.7
Non Market services	468	22.1
Total	1979	100

Source: *Based on Wilson (2001a) .*

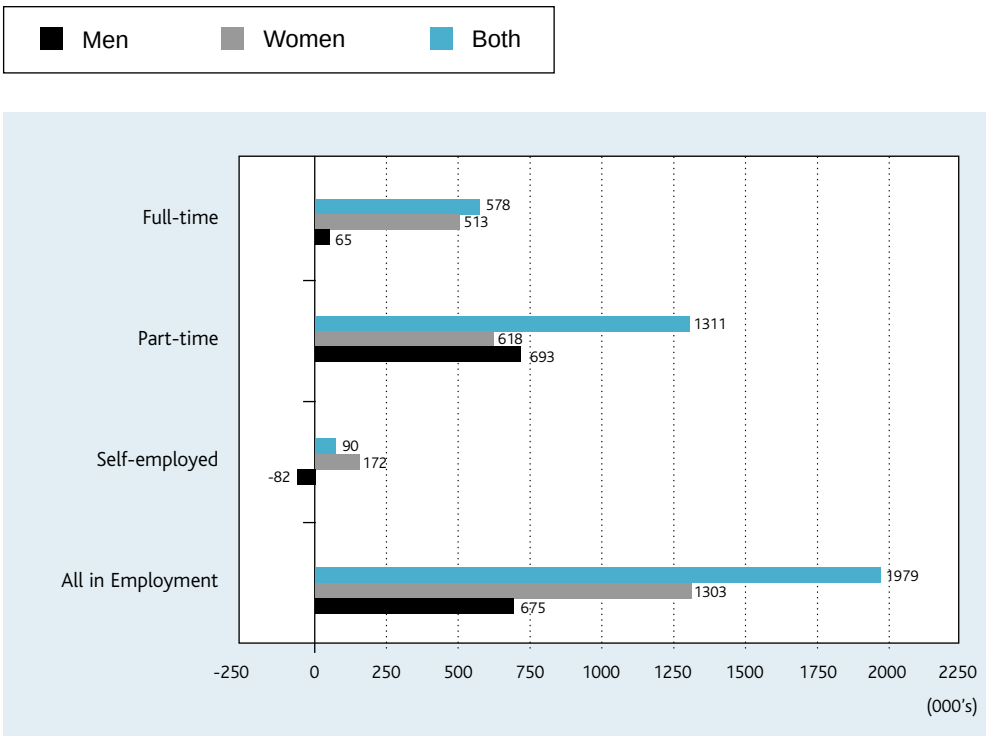
Note: *Primary = agriculture, mining and utilities*

Distribution = retail and wholesale distribution, hotels and catering, and transport and communications

Business = Professional Services, banking and business services and other personal services

Non-Market = Health, education, public administration and defence.

Figure 6.2 Changes in Employment Status and Gender, England: 1999-2010 (000's)



Source: *Based on Wilson (2001a).*

Employment Status and Gender

Further changes in gender and status mix are projected, with further job losses for full-time men...

6.33 Changes projected by sector are expected to be accompanied by continuing shifts in the mix of employment by gender and status. This reflects both demand and supply side factors, including the greater involvement of women in the formal economy and pressures from both supply and demand sides in favour of more flexible work patterns. The projected decline of employment in the primary and manufacturing sectors is likely to be accompanied by the loss of many more full-time jobs, most of which have traditionally been held by men.

6.34 In contrast, the projection of continued growth of employment in the service sector is likely to create many more opportunities for women, particularly in part-time jobs. By 2010 women are expected to account for over 50% of all employment, although this is heavily concentrated amongst part-time employee jobs.

and increases for women, especially part-timers.

6.35 Female employment is expected to grow much faster than for males (*see Figure 6.2*). Growth is expected to be fastest for part time employment for women, which accounts for around three-quarters of the additional jobs. In contrast with trends during the 1990s, the scale of self-employment is projected to change little. This reflects tightening up of tax rules associated with self-employment status. The most recent projections by Cambridge Econometrics (2002a and b) suggest a similar pattern although self employment is now expected to decline slightly.

Occupational trends

Sectoral shifts, technological change and other factors will affect the demand for different occupations.

6.36 The occupational structure of employment is also projected to continue to change considerably over the coming decade. The main forces driving changes in the occupational structure of employment are:

- shifts in the sectoral composition of output (themselves a function of changing patterns of consumer demand and national competitive advantage);
- technological change; and
- other changes in the way that work is organised;

Together these factors are expected to continue to alter the mix of skills that are required in order to produce the changing patterns of output and services demanded.

Job losses for many manual workers.....

6.37 Technological change and continuing pressures of international competition are expected to lead to the continued decline of manufacturing employment although output levels are expected to rise strongly. The employment decline will result in a further loss of job opportunities for many skilled craft workers and plant and machine operatives.

will be offset by growth for non-manual and white collar occupations at various levels.

6.38 On the other hand growth of service sector employment is expected to result in substantial growth in the number of jobs for many other occupations. The anticipated expansion of employment in many non-marketed, public services, for example, will lead to greater demand for many professional, managerial and clerical workers (doctors, nurses, teachers). Within the private sector, the

emphasis is more on leisure and other personal service occupations, sales occupations and for professional, associate professional, clerical and secretarial jobs.

Changes with sectors will also be important, particularly with regard to the application of IT and related technologies ...

6.39 As noted in Chapter 3, the changes in sectoral employment structure are expected to be reinforced by changes in the nature of many jobs within particular sectors. Many organisations will be restructuring the way that work is organised and making changes in response to technological innovation, especially related to Information Technology (IT). The application of IT and its integration with communication technology is at last beginning to have a dramatic effect on many clerical and secretarial jobs that were previously concerned with information processing based on paper.

Which will have additional consequences for employment.

6.40 The impact of IT and organisational changes has been projected to reduce the demand for clerical and basic secretarial skills for many years. However, it has only been recently that the overall numbers employed in such jobs have shown signs of levelling off. The continued emphasis of such technologies is expected to begin to make inroads into the overall scale of such employment over the next decade.

New technologies will lead to job losses in many areas ...

6.41 The introduction of new information and communications (ICT) based technologies in manufacturing is also expected to displace many skilled manual workers. Many jobs have been taken over by computer controlled machinery, such as robots in motor manufacturing and assembly.

6.42 The management and operation of such technologies is expected to require increased employment for many other occupations. Managerial, professional and associate professional occupations, including technicians of various kinds will be needed to install, maintain, oversee and run such equipment.

but also create many new opportunities...

6.43 Information and communication technology is also expected to continue to open up many new areas. This is particularly so in the service sector, where a myriad of new information based services are expected to be invented and marketed. This will also create many new jobs of a professional, associate professional and managerial nature.

especially for professionals etc.

6.44 As illustrated in *Figure 6.3*, the IER projections (Wilson, 2001a) indicate that the main beneficiaries will be:

- professionals;
- associate professionals/technical occupations;
- personal service occupations;
- sales and customer service occupations; and
- managers and senior officials.

Job losses will be concentrated amongst blue-collar jobs.

6.45 In contrast, the projections indicate that significant reductions in employment, are expected for:

- skilled trades;

- process, plant and machinery operatives; and
- elementary occupations.

6.46 In all cases, flexibility and further skill development while on the job are likely to be required in order to adapt to the rapidly evolving labour market requirements implied by ICT developments.

Changes in the occupational distribution of employment will have different implications for male and female workers.

6.47 The occupational structure of employment is very different by gender and this is reflected in the changes anticipated. Significant differences are expected for men and women. These are summarised in *Figure 6.3*. For men, the biggest projected increases are for professionals and associate professionals, whilst for women large increases are projected for personal services occupations, associate professionals and professionals.

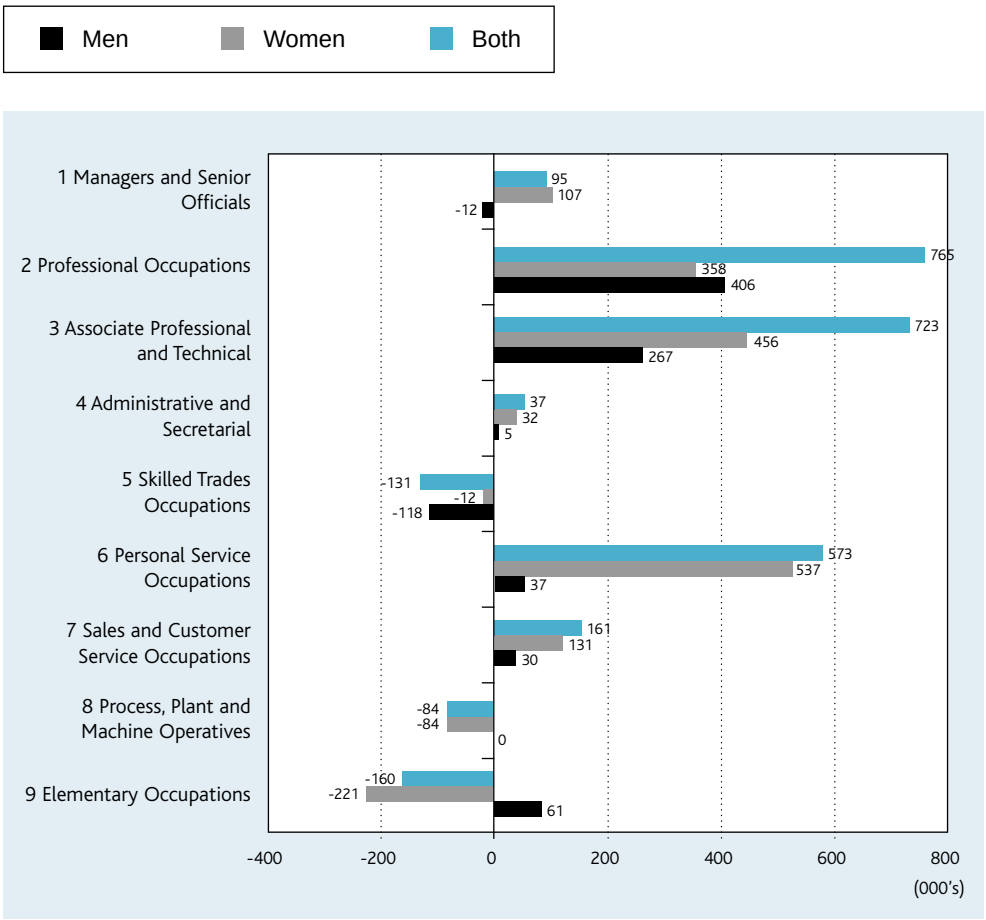
6.48 Job losses for men are concentrated primarily amongst skilled trades. For women it is amongst operatives and unskilled elementary occupations (including cleaners).

6.49 There are also some differences in terms of employment status (full-time, part-time and self-employment). Whilst the growth in associate professional jobs overall is mainly in full-time jobs, in professional jobs a substantial increase in part-time and self-employment is also expected. For managers, the main growth is in full-time employment. In both administrative/clerical/secretarial occupations and in sales and customers services, a substantial growth in part-time employment is projected, offsetting a sharp decline in full-time jobs.

In general, these represent the continuation of long established trends.

6.50 Generally these projected changes can be seen as a continuation of long-term trends. Significant increases are projected for white collar, non-manual employment, especially in the service sector. On the downside blue collar, manual jobs, largely but not exclusively associated with manufacturing and primary sectors, are projected to decline. The main exception is for administrative and secretarial occupations, where developments in IT/computing are leading to a marked slow down in jobs growth compared to previous years, a process which particularly impacts on women.

Figure 6.3 Occupational Change by Gender, England: 1999-2010 (000's)



Source: *Based on Wilson (2001a).*

6.51 IER also carried out projections at the more detailed level of the 25 'sub major' occupational groups (*see Table 6.2*). These highlight that the largest employment increases are expected in: caring personal service occupations; business and public service associate professionals; business and public service professionals; teaching and research professionals; science and technology professionals; and corporate managers. These six groups 'account for' nearly 85% of the expected job growth over the coming decade.

More detailed occupational projections reveal a more complex pattern.

6.52 Despite some job losses, administrative and clerical occupations and clerical and services related elementary occupations, together with sales occupations and corporate managers, are expected to remain the largest four occupational groups, accounting for over a third of total employment in 2010. As noted below, even where occupations are expected to see declining job numbers, this does not mean that there will not continue to be large numbers of job openings in these areas, with concomitant education and training implications.

Nevertheless, managers, administrative and clerical occupations will continue to be the largest categories of employment.

Table 6.2 Occupational Change, England: 1999-2010

	Level (000's) 1999	Level (000's) 2010	Change 1999-2010	% share 1999	% share 2010
Corporate Managers	2350	2573	222	10.0	10.1
Managers/Proprietors in Agriculture and Services	842	715	-128	3.6	2.8
Science and Technology Professionals	780	1013	234	3.3	4.0
Health Professionals	201	282	81	0.9	1.1
Teaching and Research Professionals	997	1199	202	4.3	4.7
Business and Public Service Professionals	627	875	248	2.7	3.4
Science and Technology Associate Professionals	345	349	4	1.5	1.4
Health and Social Welfare Associate Professionals	722	910	188	3.1	3.6
Protective Service Occupations	222	274	52	0.9	1.1
Culture, Media and Sports Occupations	442	579	137	1.9	2.3
Business and Public Service Associate Professionals	1230	1572	342	5.3	6.2
Administrative and Clerical Occupations	2481	2612	131	10.6	10.3
Secretarial and Related Occupations	993	899	-94	4.2	3.5
Skilled Agricultural Trades	257	229	-28	1.1	0.9
Skilled Metal and Electrical Trades	1315	1237	-78	5.6	4.9
Skilled Construction and Building Trades	839	795	-44	3.6	3.1
Textiles, Printing and Other Skilled Trades	761	779	19	3.2	3.1
Caring Personal Service Occupations	869	1280	411	3.7	5.0
Leisure and Other Personal Service Occupations	479	641	162	2.0	2.5
Sales Occupations	1450	1606	156	6.2	6.3
Customer Service Occupations	87	92	5	0.4	0.4
Process, Plant and Machine Operatives	1240	1122	-118	5.3	4.4
Transport and Mobile Machine Drivers and Operatives	801	835	34	3.4	3.3
Elementary Occupations: Trades, Plant and Machine Related	844	826	-18	3.6	3.3
Elementary Occupations: Clerical and Services Related	2242	2100	-142	9.6	8.3
Total	23418	25396	1979	100.0	100.0

Source: *Based on Wilson (2001a).*

The most detailed occupational projections available distinguish over 80 occupations.

6.53 It is also possible to develop more detailed occupational projections. The IER projections (Wilson, 2001a) included detailed results for 81 groups (three digit) of the 'SOC 2000' classification. Such information can be useful to those planning education and training provision; to providers of education and training; and to those providing careers information and advice. Although it must be borne in mind these are often subject to potentially large and uncertain margins of error, they can provide some useful insights for both policy makers and individuals about the changing nature of the demand for skills.

At this level the patterns of change are very diverse.

6.54 As well as presenting the results for the detailed categories, *Table 6.3* also shows the projections at the 'sub major', two digit level of occupations for comparison. These are for the whole of the UK. Corresponding data are not available for England but patterns of change are likely to be similar to those shown here. The patterns of change are quite diverse. The annual rates of change vary from very high rates of growth for occupations at the head of the table (categories such as ***leisure and travel service occupations*** increasing by almost 5% pa) to quite precipitous job losses (for categories like ***housekeepers*** at -6% a year).

Leisure, caring and business related occupations, including ICT professionals, are projected to grow fastest.

6.55 Occupational groups experiencing the most rapid growth (more than 3% a year) are expected to include: ***caring and personal services occupations; healthcare and related personal services; business and statistical professionals; leisure and travel service occupations; ICT professionals;*** and ***childcare and related personal services.***

6.56 A number of relatively large occupational groups are projected to experience quite rapid job losses (more than 2% a year). These include ***cleansing service elementary occupations*** *and* ***plant and machine operatives.***

6.57 The projections indicate quite wide variations in growth prospects within many of the broader groupings, indicating the importance of considering the more detailed breakdowns. For example, amongst managers, while the number of jobs for ***health and social services managers*** are projected to increase quite rapidly, the numbers of ***managers and proprietors in agriculture and service industries*** are expected to fall. These differences reflect different prospects for individual industries as well as detailed changes in work patterns within industries.

6.58 Some of the fastest increases are expected for other professional and associate professional occupations. These include ***legal professions,*** and ***health professionals,*** as well as in the associate professional categories design, ***media, artistic and literary*** and ***sports and fitness*** categories are all projected to grow by 2% a year or more. In contrast, the ***draughts persons and building inspectors*** group is projected to be amongst the fastest rates of decline.

It is amongst particular blue-collar manual occupations, especially the least skilled categories, that the largest job losses are expected.

6.59 Most ***clerical and secretarial occupations*** are projected to experience well below average employment growth. ***Healthcare and childcare occupations*** are projected to see some of the fastest growth rates. Most blue-collar occupations are expected to see quite rapid job losses. These include ***metal working trades, textile and garment trades, skilled craft jobs in metal forming, metal machining, electronics and vehicle assembly*** as well as ***plant and machine operatives.*** Some job growth is anticipated for ***transport drivers and operatives.*** Substantial job losses are expected for many of the least skilled categories, including ***elementary agricultural trades*** and ***cleansing service operatives*** although some growth is anticipated for ***elementary security and safety services.***

Table 6.3 Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth: United Kingdom

		1999	2010	Change 1999-2010	
				000s	%p.a.
	Declining by 2% pa or more				
623	Housekeeping Occupations	125	62	-63	-6.2
541	Textiles and Garments Trades	81	53	-29	-3.9
121	Managers in Farming, Horticulture, Forestry and Fishing	35	23	-12	-3.8
911	Elementary Occupations: Agricultural Trades related	106	74	-32	-3.2
312	Draughts persons and Building Inspectors	120	88	-31	-2.7
822	Mobile Machine Drivers and Operatives	143	106	-36	-2.6
923	Elementary Occupations: Cleansing Services	880	670	-211	-2.5
812	Plant and Machine Operatives	333	262	-71	-2.1
245	Librarians and related Professionals	37	30	-8	-2.0
	Declining by between 1.0 and 1.9% pa				
613	Animal Care Services	19	16	-4	-1.9
521	Metal Forming, Welding and related Trades	211	174	-37	-1.7
122	Managers and Proprietors in Hospitality and Leisure Services	365	306	-58	-1.6
712	Sales related Occupations	250	211	-39	-1.5
12	**Managers/Proprietors in agriculture and services**	978	827	-151	-1.5
522	Metal Machining, Fitting and Instrument Making Trades	459	392	-67	-1.4
123	Managers and Proprietors in other Service Industries	578	498	-80	-1.3
116	Managers in Distribution, Storage and Retailing	540	471	-69	-1.2
913	Elementary Occupations: Process and Plant related	342	299	-43	-1.2
922	Elementary Occupations: Personal Services related	845	742	-103	-1.2
511	Agricultural Trades	328	290	-39	-1.1

Table 6.3 Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth: United Kingdom (continued)

		1999	2010	Change 1999-2010	
				000s	%p.a.
117	Protective Service Officers	41	37	-5	-1.1
813	Assemblers and Routine Operatives	558	501	-57	-1.0
	Declining by between 0 and 0.9% pa				
912	Elementary Occupations: Construction and related Trades	173	157	-16	-0.9
421	Secretarial and related Occupations	1141	1038	-104	-0.9
351	Transport Associate Professionals	55	50	-5	-0.9
81	**Process, Plant and Machine Operatives**	1499	1373	-126	-0.8
531	Construction and Building Trades	765	705	-61	-0.7
411	Administrative/Clerical Occupations: Government and Related Organisations	582	538	-44	-0.7
52	**Skilled Metal and Electrical Trades**	1545	1432	-114	-0.7
53	**Skilled Construction and Building Trades**	1001	936	-65	-0.6
92	**Elementary Occupations: Clerical and Services related**	2690	2535	-154	-0.5
115	Financial Institution and Office Managers	345	325	-19	-0.5
523	Vehicle Trades	298	283	-15	-0.5
112	Production Managers	495	472	-23	-0.4
814	Construction Operatives	141	135	-5	-0.4
91	**Elementary Occupations: Trades, Plant and Storage related**	1030	1007	-23	-0.2
311	Science and Engineering Technicians	204	200	-4	-0.2
532	Building Trades	235	231	-4	-0.2
542	Printing Trades	121	119	-2	-0.2
921	Elementary Occupations: Clerical related	412	408	-3	-0.1
31	Science and Technology Associate Professionals	401	402	1	0.0

Table 6.3 Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth: United Kingdom (continued)

		1999	2010	Change 1999-2010	
				000s	%p.a.
	Growing by between 0.1 and 0.9% pa				
524	Electrical Trades	577	582	5	0.1
925	Elementary Occupations: Sales related	95	97	1	0.1
811	Process Operatives	467	475	7	0.1
54	**Textiles, Printing and Other Skilled Trades**	905	926	21	0.2
82	**Transport and Mobile Machine Drivers and Operatives**	947	969	23	0.2
111	Corporate Managers and Senior Officials	65	67	2	0.2
415	Administrative/Clerical Occupations: General	505	520	15	0.3
414	Administrative/Clerical Occupations: Communications	111	115	4	0.3
243	Architects, Town Planners, Surveyors	133	139	6	0.4
543	Food Preparation Trades	525	552	28	0.5
41	**Administrative and Clerical Occupations**	2905	3065	160	0.5
721	Customer Service Occupations	101	107	6	0.5
211	Science Professionals	86	91	5	0.5
413	Administrative/Clerical Occupations: Records	646	687	41	0.6
821	Transport Drivers and Operatives	804	863	59	0.6
	All Occupations	27546	29673	2127	0.7
11	**Corporate Managers**	2669	2891	222	0.7
71	Sales Occupations	1714	1886	172	0.9
	Growing by between 1.0 and 1.9% pa				
232	Research Professionals	70	79	9	1.1
549	Skilled Trades N.E.C.	178	202	24	1.2
412	Administrative/Clerical Occupations: Finance	1060	1204	144	1.2

Table 6.3 Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth: United Kingdom (continued)

		1999	2010	Change 1999-2010	
				000s	%p.a.
711	Sales Assistants and Retail Cashiers	1463	1675	211	1.2
914	Elementary Occupations: Goods Handling and Storage related	409	478	68	1.4
354	Sales and related Associate Professionals	534	634	100	1.6
321	Health Associate Professionals	656	786	130	1.7
244	Public Service Professionals	142	171	28	1.7
331	Protective Service Occupations	268	322	54	1.7
322	Therapists	58	69	12	1.7
23	**Teaching and Research Professionals**	1206	1463	257	1.8
231	Teaching and Research Professionals	1137	1385	248	1.8
114	Quality and Customer Care Managers	54	67	13	1.9
	Growing by between 2.0 and 2.9% pa				
344	Sports and Fitness Occupations	37	45	9	2.0
212	Engineering Professionals	472	587	115	2.0
32	**Health and Social Welfare Associate Professionals**	884	1105	221	2.1
35	**Business and Public Service Associate Professionals**	1393	1756	363	2.1
118	Health and Social Services Managers	129	165	36	2.2
21	**Science and Technology Professionals**	895	1147	252	2.3
341	Artistic and Literary Occupations	182	234	52	2.3
113	Functional Managers	999	1287	288	2.3
629	Personal Services Occupations N.E.C.	15	20	5	2.4
34	**Culture, Media and Sports Occupations**	498	646	149	2.4
62	**Leisure and Other Personal Service Occupations**	560	735	174	2.5

Table 6.3 Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth: United Kingdom (continued)

		1999	2010	Change 1999-2010	
				000s	%p.a.
342	Design Associate Professionals	104	137	33	2.5
343	Media Associate Professionals	175	230	55	2.5
353	Business and Finance Associate Professionals	354	466	112	2.5
352	Legal Associate Professionals	36	49	12	2.7
356	Public Service and Other Associate Professionals	404	547	142	2.8
924	Elementary Occupations: Security and Safety Services	457	618	161	2.8
24	**Business and Public Service Professionals**	710	971	261	2.9
	Growing by 3.0% pa or more				
221	Health Professionals	244	339	95	3.0
213	Information and Communication Technology Professionals	337	469	132	3.0
612	Childcare and related Personal Services	306	431	125	3.2
622	Hairdressers and related Occupations	224	322	98	3.3
61	**Caring Personal Service Occupations**	1034	1505	471	3.5
323	Social Welfare Associate Professionals	170	249	79	3.6
313	IT Service Delivery Occupations	77	114	37	3.6
611	Healthcare and related Personal Services	709	1059	349	3.7
242	Business and Statistical Professionals	271	425	154	4.2
241	Legal Professionals	126	206	80	4.6
621	Leisure and Travel Service Occupations	195	331	135	4.9

Source: *Wilson (2001a), Table 4.7, page 45.*

Note: *Corresponding data are not available for England but patterns of change are likely to be similar to those shown here.*

Replacement Demand

It is important to consider replacement demands as well as projected net changes.

6.60 The discussion so far has focused on the expected net change in employment, but this can give a misleading impression of priorities for education and training. It is important to consider the need to replace the skills that will be 'lost' as part of the normal process of labour turnover due to retirement, etc. The scale of such replacement demand can be considerable.

The need to replace those retiring, etc., means that there are many job openings, even in declining occupations.

6.61 Even when 'net job losses' are projected there can be significant numbers of new job openings and the need to educate and train people with the appropriate skills to replace at least some of those leaving. The IER projections (Wilson 2001a, b) include estimates of these replacement demands. In most cases this is much more significant than any 'expansion demand' which results from net growth in employment and can easily outweigh projected decline in overall employment numbers.

Replacement demand, mainly related to retirement from the workforce, outweighs any projected declines …

6.62 Adding this replacement demand to the projected net change in employment already discussed above, an estimate of the overall requirement for each occupation can be obtained. The IER's analysis for each of the 25 occupational sub-major groups is set out in *Table 6.4* and *Figure 6.4*. This information relates to the whole of the U.K. Corresponding data are not available for England but patterns of change are likely to be similar to those shown here. Replacement demand outweighs the net projected decline in all occupations where job losses are expected. Between 1991 and 2010 there is expected to be an overall requirement of some 13½ million new job openings. Retirements from the workforce are the main factor responsible.

such that all occupational groups will see an increase in demand in future years.

6.63 In various occupations where the overall number of jobs is projected to fall quite sharply, this is more than outweighed by replacement demand elements. This applies in occupations such as managers and proprietors in agriculture and service industries; secretarial and related occupations; skilled metal and electrical trades; and plant and machine related workers. In other cases expected retirements will add to positive expansion demand to create even higher overall requirements for new entrants to these occupations.

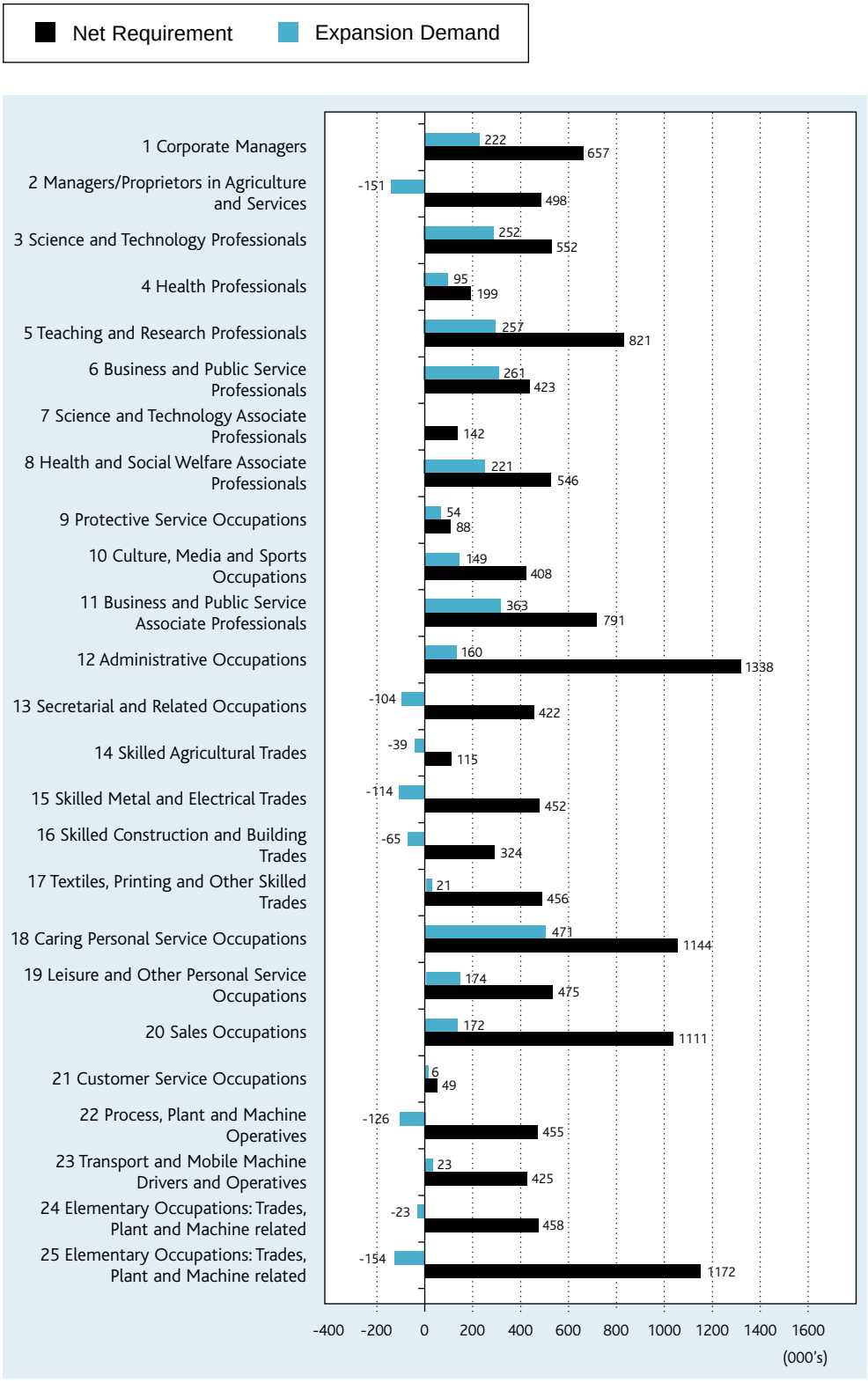
Table 6.4 Replacement Demand by SOC Sub-Major Group, United Kingdom: 1999-2010 (000's)

	(1) Expansion Demand (or Decline)	(2) Retirement and Mortality	(3) Net Outward Occupational Mobility	(4) Total Loss (Replacement Demand) (2+3)	(5) Overall Requirement (1+4)
1. Corporate Managers	222	878	-443	435	657
2. Managers/Proprietors in Agriculture and Services	-151	650	-1	649	498
3. Science and Technology Professionals	252	272	28	300	552
4. Health Professionals	95	115	-11	104	199
5. Teaching and Research Professionals	257	581	-17	564	821
6. Business and Public Service Professionals	261	261	-99	162	423
7. Science and Technology Associate Professionals	1	115	25	140	142
8. Health and Social Welfare Associate Professionals	221	365	-40	325	546
9. Protective Service Occupations	54	78	-45	33	88
10. Culture, Media and Sports Occupations	149	246	13	259	408
11. Business and Public Service Associate Professionals	363	547	-118	428	791
12. Administrative and Clerical Occupations	160	1310	-132	1178	1338
13. Secretarial and Related Occupations	-104	614	-87	526	422
14. Skilled Agricultural Trades	-39	131	22	154	115
15. Skilled Metal and Electrical Trades	-114	480	85	565	452
16. Skilled Construction and Building Trades	-65	339	50	389	324
17. Textiles, Printing and Other Skilled Trades	21	323	112	435	456
18. Caring Personal Service Occupations	471	552	121	673	1144
19. Leisure and Other Personal Service Occupations	174	239	63	301	475
20. Sales Occupations	172	760	179	939	1111
21. Customer Service Occupations	6	45	-2	43	49
22. Process, Plant and Machine Operatives	-126	582	-1	581	455
23. Transport and Mobile Machine Drivers and Operatives	23	382	20	402	425
24. Elementary Occupations: Trades, Plant and Machine Related	-23	388	93	481	458
25. Elementary Occupations: Clerical and Services Related	-154	1141	186	1327	1172
Total	**2127**	**11395**	**0**	**11395**	**13522**

Source: *Wilson (2001a) Table 4.5, Page 39.*

Note: *Corresponding data are not available for England but patterns of change are likely to be similar to those shown here.*

Figure 6.4 Net Requirements and Expansion Demand by SOC 2000 Sub-major Group, United Kingdom: 1999-2010



Source: *Wilson (2001a), Figure 4.8, Page 40.*

Note: *Corresponding data are not available for England but patterns of change are likely to be similar to those shown here.*

Changes in the Demand for Qualifications

The demand for qualified people will depend on changes in occupational mix as well as changing qualification requirements within those jobs.

6.64 The future demand for qualified people depends on a combination of the changes in occupational structure and changes in the proportion of people employed in these occupations requiring particular qualifications. The pattern of occupational employment is changing in such a manner as to increase the demand for better-qualified persons. The occupations which are increasing in importance tend to require higher qualifications, whereas those in decline are much less demanding.

However, the link between occupation and qualification is not rigid and much of the recent growth in qualified employment has been as much supply as demand driven.

6.65 In practice, there is not a rigid link between occupations and qualifications. For most occupations there is quite a wide range of qualifications which are acceptable. Typically, recent entrants are better qualified than those reaching retirement age. The average levels of qualifications held by those in employment have therefore risen because of this supply–side, "cohort effect". Nevertheless, as noted in Chapter 3, there is clear evidence that in many cases there is a real increase in requirements from the demand side as well.

Projections of qualification demand have been paralleled by IER linked to the occupational employment forecasts.

6.66 In analysing the relationship between occupational employment and qualifications, it is necessary to use SOC 1990 categories, since data are not yet available for SOC 2000 categories. In developing projections, IER have examined trends in the average mix of qualifications held by those in employment within each of 75 detailed occupational categories. These are projected forward, also taking account of likely developments on the supply side. In the main scenario developed, the qualifications mix is assumed to change, so that there is an overall balance between those employed and the numbers expected to acquire new qualifications over the next decade. The expected developments in qualifications held are referred to as the 'demand for qualifications'.

6.67 There is, of course, often a difference between the qualifications held by those undertaking a job and the qualifications actually required to undertake the job effectively. The demand measure can be regarded as an indicator of changing qualification needs and of the qualifications likely to be actually held in different occupations.

The combination of occupational change and rising average qualification requirements will lead to rapid growth, especially for higher level qualifications.

6.68 The combination of rapid growth in the numbers employed in several occupational groups where the qualification levels are relatively high (e.g. corporate managers; professionals; and associate professionals in particular) combined with the decline in several other occupational groups (e.g. secretarial and 'related' occupations; process, plant and machine operatives) where the qualification levels are relatively low will, in itself, lead to an overall increase in the demand for higher level qualifications. When this is combined with the projected changes in qualifications mix in the balance demand scenario substantial increases are expected as indicated in *Table 6.5*.

Table 6.5 Projected Change in Demand for Qualifications in England: 1999-2010 (000's)

Occupation	Employment change	Change in demand for those qualified to				
		NVQ4+	NVQ3	NVQ2	NVQ1	No quals
Corporate managers	244	336	156	-24	-188	-37
Managers in agriculture & services	-278	-47	-71	-14	-93	-53
Science & engineering profess.	228	211	29	-3	-7	-2
Health professionals	137	123	-1	2	14	0
Teaching professionals	448	442	-6	-1	13	0
Professional	358	363	18	-5	-18	0
Science & engineering ass. profess.	77	74	21	-4	-10	-3
Health associate professionals	82	104	-13	-2	-7	0
Other associate professional	327	318	64	0	-44	-11
Clerical	-82	52	-21	-5	-39	-69
Secretarial	-130	-8	-64	-15	-26	-17
Skilled construction trades	21	2	19	-4	27	-24
Skilled engineering trades	-28	-4	12	-13	-4	-18
Other skilled trades	-85	-10	4	-17	9	-70
Protective service	52	16	47	1	-3	-9
Personal service	422	66	34	41	379	-98
Sales representatives	-11	6	-9	-2	1	-6
Other sales	30	14	96	19	-21	-79
Indus. plant & machine operatives	41	-1	-16	2	154	-98
Drivers & mobile machine operatives	17	1	-5	-3	47	-23
Other occ. in agriculture etc.	-24	-2	-7	-1	-8	-6
Other elementary	88	1	-2	14	225	-151
Total	1933	2057	283	-33	402	-776
As a % New Jobs	100	106	15	-2	21	-40
% of current workforce qualified to each NVQ level in 2000		34	7	-1	8	-27

Source: *Wilson (2001a), balance demand scenario.*

6.69 The majority of the net increase in jobs projected is expected to be at NVQ level 4 or above. Around a quarter are expected to be for those qualified to NVQ level 3 and just under a fifth at level NVQ level 2 or equivalent. The demand for those without any formal qualifications is projected to fall. The most rapid growth at NVQ level 4 is amongst 'other' professionals, 'other' associate professionals and teaching professionals. At NVQ level 3 or equivalent the growth is greatest amongst personal service occupations and 'other' associate professionals.

6.70 By 2010, in this scenario, nearly a third of those in employment are expected to be qualified to NVQ level 4/5 or equivalent. In contrast, below 10% are projected to have no formal qualifications.

Trends in Skill Requirements

The demand for basic, key and generic skills is also projected to increase.

6.71 Trends in occupational employment qualifications can provide useful insights into the changing skill needs of the economy but they do not tell the whole story. Employers are placing increasing emphasis upon basic, key, and various generic skills such as communication, IT, team working, problem solving, reasoning and work process skills. The IER projections have also considered how these might change in the coming decade. Results based on the 1997 Skills Survey were published in 2000/2001.

6.72 As discussed in more detail in Chapter 3, the Skills Surveys examined an extensive range of key and generic skills. These were then combined and reduced to eight: verbal, manual, problem solving, numerical, planning and three aspects of communication skills: client, horizontal (colleagues) and professional. *Table 6.6* sets out the projections based on the assumption of a continuing rate of change of those skills as observed during the 1990s. The data are based on a set of 'scores', where positive scores indicate a 'high' importance given to the skill, and negative scores indicates a 'low' importance. *Table 6.6* uses information from the 1997 survey.

Verbal, numerical, planning and various communications skills will be in greater demand.

6.73 The results suggest that many skills are likely to become increasingly important, including verbal skills, numerical skills, planning skills and various types of communication skills. There is no increase apparent in problem solving skills however, and manual skills are seen to be of decreasing importance. Verbal skill requirements are increasing most amongst managers; numerical skills most among clerical and secretarial occupations; planning skills most among sales; and communication skills most amongst managers (in relation to horizontal and professional communication).

Table 6.6 Changing Generic Skill Requirements 1999-2010

Major Occupation Groups (SOC 1990)	Verbal		Manual		Problem Solving		Numerical		Planning		Client Communication		Horizontal Communication		Professional Communication	
	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010
Managers and Administrators	0.25	0.29	-0.18	-0.24	0.13	0.15	0.56	0.57	0.56	0.57	0.52	0.49	0.22	0.25	0.41	0.44
Professional Occupations	0.71	0.72	-0.46	-0.47	0.18	0.19	0.55	0.55	0.57	0.57	0.15	0.16	0.30	0.29	0.85	0.84
Associate Professional and Technical Occupations	0.42	0.41	-0.29	-0.31	0.33	0.31	0.07	0.06	0.31	0.32	0.20	0.22	0.18	0.18	0.43	0.43
Clerical and Secretarial Occupations	0.21	0.20	-0.60	-0.60	0.15	0.16	0.06	0.08	-0.14	-0.15	-0.17	-0.17	0.08	0.07	-0.53	-0.52
Craft and Related Occupations	-0.26	-0.27	1.04	1.04	0.44	0.43	-0.03	-0.03	-0.21	-0.19	-0.26	-0.26	-0.33	-0.33	0.05	0.05
Personal and Protective Services Occupations	-0.07	-0.07	0.19	0.20	-0.50	-0.50	-0.62	-0.62	0.07	0.06	0.02	0.02	0.39	0.38	-0.19	-0.19
Sales Occupations	-0.38	-0.40	-0.27	-0.25	-0.37	-0.39	0.00	-0.02	-0.46	-0.49	0.93	0.93	-0.23	-0.23	-0.59	-0.61
Plant and Machine Operatives	-0.51	-0.50	0.64	0.63	-0.05	-0.06	-0.29	-0.30	-0.56	-0.55	-0.59	-0.58	-0.35	-0.35	-0.37	-0.38
Other Occupations	-0.93	-0.93	0.40	0.39	-0.93	-0.94	-0.89	-0.89	-0.64	-0.65	-0.67	-0.66	-0.51	-0.50	-0.36	-0.37
TOTAL	0.01	0.06	0.02	-0.03	0.00	0.00	0.01	0.03	0.02	0.06	0.04	0.06	0.01	0.05	0.01	0.04

Source: *Wilson (2001a), Table 6.2, page 82.*

Note: *Skill scores can be negative (low importance) to positive (high importance) across all occupations. The scores average zero in the original sample (they differ slightly from zero here because the current and projected occupational structure of the UK workforce differs from that in the original sample).*

6.74 The Skills Surveys also enable an analysis of other kinds of work skills including:

- autonomy (reflecting closeness of supervision and the extent of choice over job tasks);
- required qualifications (reflecting the level of qualifications someone would need 'today' to get the type of job an individual already held);
- training time (reflecting the amount of training, since starting the type work they do that had been undertaken);
- learning time (reflecting how long it took workers to learn how to do the job well); and
- a composite index of the above.

6.75 When these changes are projected (Wilson, 2001a), they suggest an increase in training time, and in required qualifications. A small increase in learning time is projected but there is no real change expected in relation to autonomy. There are some differences across occupations:

- **autonomy** – projected to increase amongst craft and related occupations but decline for both professional and sales occupations;
- **learning time** – projected to rise amongst associate professional and craft occupations;
- **training time** – expected to increase substantially amongst professional and personal service occupations, and also for clerical and craft occupations;
- **required qualifications** – projected to rise amongst personal and protective service occupations as well as professional, associate professional and craft occupations and;
- **composite index** – expected to increase most amongst managerial, professional, associate professional, craft and personal services occupations.

The amount of training time, learning time and levels of qualifications required are expected to increase in many occupations.

Regional Variations in Future Skill Needs

Differences in existing economic structure and general prospects will mean marked variations in skills needs across regions ...

6.76 Differences in general economic prospects, together with differences in their existing employment structures, mean that the skills needs of different regions will vary significantly. Overall economic growth and employment prospects are projected to be most buoyant in the southern part of England. This is reflected in terms of occupational employment, qualifications and other indicators.

with the southern regions expected to see the most rapid growth.

6.77 The South East, East of England, and South West regions are expected to record the fastest jobs growth over the coming decade. The West Midlands, Yorkshire and the Humber, the North West, and the North East are all projected to experience growth rates well below the national average. The four regions of the South East, South West, London, and the East of England are projected to account for 70% of the expected 2 million or so additional jobs expected over the period to 2010.

Sectoral prospects by region

6.78 Details of the sectoral employment prospects for individual regions at the level of the 22 sectors used in Volume 2 of the *Skills in England 2002* are shown in *Tables 6.7* and *6.8*. These are based on the most recent projections produced on behalf of the DfES (Wilson, 2001b). The dependence of particular regions on certain sectors of employment is illustrated in *Table 6.7*, which shows the scale of employment in each sector. While it is clear that distribution, business and public services now account for a very significant part of employment in all regions, the importance of manufacturing in many regions is also apparent. The changes expected over the decade to 2010 shown in *Table 6.8* illustrate the preponderance of negative effects in the top part of the table (primary, manufacturing and utilities). These are especially significant in both absolute and percentage terms for many regions in the Midlands and the north of England.

Table 6.7 Projected Employment Levels by Detailed Sector, 1999-2010 (000's)

	London		South East		East of England		South West		West Midlands		East Midlands		Yorkshire and The Humber		North West		North East		England	
	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010	1999	2010
Agriculture	7	6	81	80	55	38	77	62	48	43	43	34	42	38	30	22	17	15	399	339
Mining & quarrying	4	3	5	4	4	2	6	4	3	3	6	4	6	4	3	4	3	1	40	29
Food, drink & tobacco	29	22	37	35	46	34	43	37	40	38	59	57	61	56	70	60	22	21	407	359
Textiles & clothing	27	14	10	4	14	9	15	9	23	12	76	34	46	27	58	29	12	7	280	143
Wood, paper & publishing	116	121	89	94	65	62	47	48	42	38	49	50	56	54	67	63	19	20	552	550
Manufactured fuels	1	0	6	5	1	1	1	1	1	1	0	0	2	3	13	12	0	0	27	23
Chemicals & plastics	26	22	63	68	44	36	33	30	53	45	48	50	50	42	86	71	34	33	437	395
Non-metallic mineral products	4	3	11	9	9	6	8	8	41	33	16	13	15	9	15	10	5	3	125	95
Metals & metal goods	22	16	49	39	37	31	33	28	129	98	48	38	75	57	52	44	28	21	473	372
Engineering	47	36	156	147	98	66	86	83	121	99	75	67	69	61	90	81	44	37	785	677
Transport equipment	15	7	38	16	36	28	45	33	76	54	36	23	25	19	55	40	17	11	345	232
Manufacturing nes & recycling	23	20	32	29	26	27	21	22	29	29	26	26	29	30	30	28	12	12	227	222
Electricity gas and water	8	5	20	13	13	13	15	11	17	14	9	8	13	7	15	10	8	6	119	87
Construction	184	168	286	330	197	193	164	201	141	133	125	133	145	126	178	175	66	65	1486	1526
Distribution	636	659	665	728	446	545	393	438	412	457	316	344	371	398	525	565	163	172	3926	4307
Hotels & catering	251	259	208	207	124	133	149	165	120	125	94	94	115	122	166	173	56	55	1284	1335
Transport	245	243	155	171	104	118	76	89	90	104	78	91	91	101	139	137	38	41	1014	1095
Communications	99	92	69	83	51	70	37	41	38	39	26	28	36	38	47	59	16	20	419	470
Banking & insurance	247	224	136	159	67	62	67	71	66	69	34	33	70	83	80	72	21	21	788	794
Business services	1051	1322	728	1048	391	540	304	416	318	450	228	330	264	355	394	525	103	119	3781	5106
Public services	793	821	854	922	503	581	552	614	531	586	404	458	526	570	693	753	283	303	5139	5607
Miscellaneous services	313	372	224	257	136	167	129	157	119	146	97	121	120	146	167	194	59	75	1365	1635
All industries	4148	4436	3922	4448	2466	2763	2301	2567	2460	2615	1894	2037	2228	2344	2975	3127	1025	1059	23418	25396

Source: *Based on Wilson (2001b).*

Table 6.8 Projected Employment Change by Detailed Sector, 1999-2010

	London		South East		East of England		South West		West Midlands		East Midlands		Yorkshire and The Humber		North West		North East		England	
	000's	%	000's	%	000's	%	000's	%	000's	%	000's	%	000's	%	000's	%	000's	%	000's	%
Agriculture	-1	-19	-1	-1	-17	-31	-15	-20	-6	-11	-8	-20	-4	-9	-7	-25	-1	-7	-61	-15
Mining & quarrying	-1	-25	-1	-16	-1	-32	-1	-26	-1	-18	-2	-37	-3	-43	1	19	-2	-59	-11	-28
Food, drink & tobacco	-7	-23	-3	-7	-12	-26	-6	-14	-2	-5	-1	-2	-6	-9	-10	-14	-1	-6	-48	-12
Textiles & clothing	-13	-49	-6	-61	-5	-35	-6	-38	-11	-48	-41	-55	-19	-42	-29	-51	-6	-48	-137	-49
Wood, paper & publishing	5	4	5	5	-4	-6	0	1	-5	-11	1	1	-2	-3	-4	-6	2	9	-2	0
Manufactured fuels	-1	-65	-1	-14	0	2	-1	-43	0	-41	0	-2	0	6	-2	-14	0	89	-4	-15
Chemicals & plastics	-4	-16	5	7	-8	-18	-4	-11	-8	-15	2	4	-8	-16	-15	-17	-1	-4	-41	-9
Non-metallic mineral products	-1	-28	-2	-18	-3	-34	-1	-8	-8	-19	-3	-20	-6	-38	-5	-35	-2	-33	-31	-25
Metals & metal goods	-6	-29	-10	-20	-6	-16	-5	-16	-31	-24	-10	-21	-19	-25	-8	-15	-7	-25	-101	-21
Engineering	-10	-22	-9	-6	-32	-32	-3	-3	-22	-18	-8	-10	-8	-12	-9	-10	-7	-16	-108	-14
Transport equipment	-8	-52	-22	-57	-8	-21	-12	-27	-22	-29	-13	-37	-6	-25	-16	-28	-6	-34	-113	-33
Manufacturing nes & recycling	-3	-13	-3	-9	1	3	1	6	0	0	0	0	0	1	-2	-6	0	-1	-5	-2
Electricity gas and water	-3	-37	-8	-37	0	-3	-3	-24	-4	-22	-2	-19	-6	-48	-5	-32	-1	-18	-33	-27
Construction	-15	-8	44	15	-3	-2	37	23	-9	-6	8	6	-19	-13	-3	-2	0	-1	40	3
Distribution	23	4	64	10	99	22	46	12	45	11	28	9	27	7	41	8	9	6	381	10
Hotels & catering	8	3	-1	-1	9	8	16	11	5	4	0	0	7	6	7	4	-1	-2	51	4
Transport	-2	-1	16	10	14	14	13	16	15	16	13	17	11	12	-1	-1	4	10	81	8
Communications	-7	-7	14	21	19	38	4	11	1	3	2	8	2	6	11	24	4	23	51	12
Banking & insurance	-22	-9	23	17	-5	-7	4	6	3	4	-1	-3	13	18	-8	-10	0	-1	6	1
Business services	271	26	320	44	149	38	112	37	132	41	102	45	92	35	131	33	16	16	1325	35
Public services	28	3	68	8	78	15	62	11	55	10	54	13	44	8	60	9	20	7	468	9
Miscellaneous services	59	19	33	15	31	23	28	22	27	22	24	24	26	21	26	16	16	27	269	20
All industries	288	7	526	13	297	12	266	12	155	6	143	8	116	5	153	5	34	3	1979	8

Source: *Based on Wilson (2001b).*

Occupational prospects by region

6.79 Trends in occupational structure are expected to follow similar patterns in most regions to those at national level. However, the different industrial structures, combined with different overall employment growth prospects mean that there are some substantial differences in occupational prospects across the regions over the coming decade.

6.80 There is expected to be especially strong growth in demand for managers in South East and East of England regions; for professionals in London and the South East; and for associate professional/technical occupations in the South East, South West, and East of England. In terms of qualifications the increases, in relation to level 3, are likely to be greatest in the East of England and South East.

This will affect managers, professional and associate professionals especially.

6.81 ***Managers*** account for a disproportionately high share of managerial occupations in London, the South East and the East of England. This is projected to become even more pronounced with the largest increases being in the South East and East of England regions. Some growth is anticipated in the South West, London and the East Midlands. Elsewhere, job losses are projected, particularly in the North West and the North East.

6.82 The share of employment in ***professional occupations*** is projected to increase across all regions. London and the South East are again projected to be the main hot spots. The North East is expected to have the lowest rate of employment increase across the English regions, but even here this represents a substantial increase.

6.83 ***Associate professional & technical occupations*** are currently over-represented in London and the South East. Employment for these occupations is also expected to grow most rapidly here and in the East of England region and the South West. In the North East and Yorkshire and The Humber the rate of increase projected is just half that expected for the UK as a whole.

Rates of increase in the northern regions are expected to be much less for associate professionals.

6.84 ***Administrative, clerical & secretarial occupations*** also account for a disproportionately large share of employment in London and the South East. However, trends here are downward. In contrast some growth is expected in other regions, notably the West Midlands.

6.85 Both shares and proportions employed in ***personal service occupations*** are expected to rise in all regions. In many cases these changes are very significant, especially in the West Midlands, East Midlands, and the East of England. Growth is expected to be slowest in the North East and London.

The demand for personal service, sales and customer care occupations is expected to grow everywhere.

6.86 All regions are also projected to experience employment growth in ***sales*** and ***customer service occupations.*** The fastest increases are expected in the South West, the East of England region, the East Midlands and West Midlands. London, and the South East are the slowest growing regions for this occupational group.

6.87 Employment amongst ***skilled trades*** is generally expected to decline, but some modest increases are projected for the South East and the South West. The East Midlands is projected to witness the largest job losses in this area.

The demand for skilled manual workers is projected to decline in most regions...

as is the demand for process plant and machine operatives...

6.88 ***Process, plant and machine operatives*** are projected to see significant job losses across England as a whole. Some modest job gains are expected in both the South East and the South West. Other regions show falling employment in terms of both shares and absolute levels, with London expected to bear the brunt.

and most unskilled occupations.

6.89 Employment in ***elementary occupations*** is expected to decline nationally over the period to 2010. Over 80% of the projected job losses are concentrated in London, the West Midlands, and the North West.

There is considerable variation across regions at a detailed occupational level.

6.90 The projections produced by IER (Wilson, 2001b) also enable a more detailed examination of occupational trends at regional level, using the 25 SOC 2000 sub-major occupational groups (*see Table 6.9*). *Table 6.10* provides some further insights into how the importance of different occupational categories varies across regions as well as those which are growing or declining most rapidly.

Table 6.9 Projected Employment Change, 1999-2010 by Occupational Sub-major Group

Occupational Group	London				South East				East of England				South West				West Midlands				UK
	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	% Change
Corporate Managers	487	540	53	10.8	458	536	78	16.9	265	301	36	13.5	214	244	30	13.8	219	226	7	3.2	8.3
Managers/ Proprietors In Agriculture & Services	160	134	-26	-16.5	146	128	-18	-12.5	91	82	-9	-9.4	91	79	-12	-13.7	75	61	-14	-19.1	-15.4
Science & Technology Professionals	137	177	41	29.8	162	225	63	38.6	95	124	30	31.4	74	96	22	29.6	76	94	18	24.1	28.2
Health Professionals	48	66	19	39.4	29	41	11	38.8	19	29	11	57.6	18	22	4	25.1	17	23	5	31.3	38.9
Teaching & Research Professionals	188	253	65	34.4	166	196	30	18.0	99	118	19	19.7	108	139	31	28.6	99	106	7	7.0	21.3
Business & Public Service Professionals	193	281	88	45.8	109	159	50	46.2	60	85	24	40.3	50	70	20	39.3	48	62	15	30.9	36.7
Science & Technology Associate Professionals	62	60	-2	-3.6	64	67	3	4.6	38	39	1	2.6	32	34	2	4.9	32	31	-1	-4.0	0.3
Health & Social Welfare Associate Professionals	146	211	66	45.3	113	135	22	19.5	67	85	18	26.8	74	88	14	19.0	70	93	22	31.8	25.0
Protective Service Occupations	47	54	8	16.6	39	54	16	40.6	20	29	8	40.9	16	18	2	15.2	21	26	5	21.7	20.3
Culture, Media & Sports Occupations	143	197	54	37.9	78	105	27	34.8	45	59	15	32.7	38	51	13	34.1	33	42	9	28.2	29.9
Business & Public Service Associate Professionals	300	407	106	35.4	229	301	73	31.7	129	169	40	30.5	110	145	35	31.3	113	139	26	23.3	26.1
Administrative Occupations	474	407	-67	-14.2	428	441	13	3.2	252	269	17	6.9	230	249	19	8.1	258	307	49	19.1	5.5
Secretarial & Related Occupations	224	176	-48	-21.5	196	178	-18	-9.0	110	100	-9	-8.4	86	77	-10	-11.0	92	92	0	0.1	-9.1
Skilled Agricultural Trades	14	12	-1	-9.2	43	45	2	4.4	29	25	-4	-14.9	42	34	-8	-18.0	37	34	-3	-6.8	-11.7

Table 6.9 Projected Employment Change, 1999-2010 by Occupational Sub-major Group (continued)

Occupational Group	London				South East				East of England				South West				West Midlands				UK
	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	% Change
Skilled Metal & Electrical Trades	170	156	-14	-8.3	202	213	10	5.2	139	135	-4	-2.9	130	132	1	1.0	181	158	-23	-12.7	-7.4
Skilled Construction & Building Trades	109	99	-10	-8.9	138	148	9	6.7	98	93	-5	-5.0	98	104	7	6.7	96	85	-11	-11.2	-6.5
Textile, Printing & Other Skilled Trades	125	122	-3	-2.0	114	122	8	7.4	79	87	8	9.8	78	87	9	12.0	79	81	3	3.8	2.3
Caring Personal Service Occupations	115	158	43	37.2	139	201	62	44.6	87	132	45	51.2	98	147	50	50.8	96	155	58	60.6	45.5
Leisure & Other Personal Service Occupations	91	111	20	21.9	80	112	32	39.6	50	76	26	52.2	46	62	15	32.7	47	67	20	42.8	31.1
Sales Occupations	212	220	8	3.9	225	243	18	8.0	156	178	22	13.8	159	185	27	16.9	150	171	21	13.8	10.1
Customer Service Occupations	16	14	-1	-8.7	15	16	1	4.1	9	10	1	7.0	8	9	1	9.0	9	11	2	16.9	5.6
Process, Plant & Machine Operatives	89	42	-47	-52.9	149	142	-7	-5.0	122	112	-10	-8.0	121	124	4	2.9	191	172	-19	-9.8	-8.4
Transport & Mobile Machine Drivers & Operators	126	120	-6	-4.8	117	136	20	16.9	82	86	4	5.2	73	79	6	8.8	90	93	3	3.3	2.4
Elementary Occupations: Trades, Plant & Storage Related	84	70	-14	-16.6	126	138	12	9.3	96	96	0	-0.2	89	92	4	4.2	105	96	-9	-9.0	-2.2
Elementary Occupations: Clerical & Service Related	391	348	-43	-11.0	354	364	10	2.8	230	244	14	6.1	218	200	-18	-8.2	224	189	-35	-15.7	-5.7

Table 6.9 Projected Employment Change, 1999-2010 by Occupational Sub-major Group (continued)

Occupational Group	East Midlands				Yorks & The Humber				North West				North East				UK
	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	% Change
Corporate Managers	179	190	11	6.3	194	199	5	2.5	261	265	4	1.6	73	73	0	-0.5	8.3
Managers/Proprietors In Agriculture & Services	66	57	-10	-14.7	78	66	-12	-15.3	101	79	-22	-21.4	34	30	-4	-12.9	-15.4
Science & Technology Professionals	58	78	19	32.8	57	69	13	22.4	95	120	25	26.5	26	30	4	13.5	28.2
Health Professionals	15	24	9	56.8	19	27	8	39.6	24	31	7	26.8	11	18	7	61.0	38.9
Teaching & Research Professionals	69	73	4	6.2	93	103	10	11.1	132	164	32	24.4	43	46	3	7.5	21.3
Business & Public Service Professionals	40	57	17	41.3	47	62	14	30.0	61	77	17	27.3	19	22	3	17.8	36.7
Science & Technology Associate Professionals	25	26	1	3.4	31	31	1	2.0	45	46	1	1.7	15	15	0	-1.4	0.3
Health & Social Welfare Associate Professionals	52	62	10	20.1	64	68	4	6.9	100	122	22	22.3	36	45	8	23.1	25.0
Protective Service Occupations	16	20	4	24.1	23	27	5	20.0	30	35	5	15.5	11	12	1	8.2	20.3
Culture, Media & Sports Occupations	23	29	5	23.0	29	33	4	13.8	42	51	9	21.7	11	12	1	4.5	29.9
Business & Public Service Associate Professionals	85	105	20	23.9	94	109	15	15.8	132	156	24	18.2	37	40	3	8.6	26.1
Administrative Occupations	184	214	31	16.7	232	266	35	14.9	323	355	32	9.8	102	104	2	2.1	5.5
Secretarial & Related Occupations	66	68	2	2.3	80	78	-2	-2.8	108	102	-6	-5.4	31	28	-3	-9.7	-9.1
Skilled Agricultural Trades	27	22	-5	-17.2	26	22	-4	-15.6	26	22	-5	-18.4	14	13	-1	-5.8	-11.7

Table 6.9 Projected Employment Change, 1999-2010 by Occupational Sub-major Group (continued)

Occupational Group	East Midlands				Yorks & The Humber				North West				North East				UK
	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	1999 000s	2010 000s	Change 000s	% Change	% Change
Skilled Metal & Electrical Trades	120	106	-13	-11.3	133	117	-16	-12.1	176	163	-13	-7.5	64	59	-5	-8.4	-7.4
Skilled Construction & Building Trades	70	59	-11	-15.7	89	79	-10	-11.5	102	92	-10	-9.8	40	37	-3	-8.0	-6.5
Textile, Printing & Other Skilled Trades	68	61	-6	-9.6	78	79	1	1.4	106	105	-1	-0.5	35	34	-1	-3.5	2.3
Caring Personal Service Occupations	77	123	46	59.4	91	130	40	43.8	123	177	54	44.0	43	57	14	33.4	45.5
Leisure & Other Personal Service Occupations	37	52	16	42.4	44	57	12	27.3	61	78	16	26.6	22	27	5	22.7	31.1
Sales Occupations	117	133	17	14.2	147	161	14	9.4	204	227	23	11.2	80	87	7	9.0	10.1
Customer Service Occupations	7	8	1	14.2	8	9	1	9.8	12	12	1	7.9	3	3	0	1.0	5.6
Process, Plant & Machine Operatives	154	143	-12	-7.5	156	153	-2	-1.4	186	160	-26	-13.9	73	74	1	0.7	-8.4
Transport & Mobile Machine Drivers & Operators	71	71	-1	-0.9	87	88	1	1.7	118	124	6	5.1	38	38	0	-0.8	2.4
Elementary Occupations: Trades, Plant & Storage Related	86	88	2	2.4	105	106	1	0.5	108	97	-11	-10.4	44	43	-1	-2.2	-2.2
Elementary Occupations: Clerical & Service Related	183	169	-14	-7.4	224	205	-19	-8.7	300	268	-32	-10.6	118	114	-5	-4.1	-5.7

Source: *Wilson (2001b), Table(s) 2, Pages 31, 40, 50, 60, 70, 81, 89, 99, 110.*

Note: *All absolute figures rounded to the nearest thousand.*

Table 6.10 Projected Changes in Occupational Structure by Region

SOC 2000 Sub Major Groups	Regions												
	London	South East	East of Eng.	South West	West Midlands	East Midlands	Yorks & The Humber	North West	North East	England	Wales	Scotland	Northern Ireland
Corporate managers													
Managers and Proprietors								-					-
Science/Tech Professionals	+	+	+	+	+	+	+	+		+			+
Health professionals	+	+	+	+	+	+	+	+	+	+		+	
Teaching/Research Prof.	+		+					+		+		+	+
Business/Public service Prof.	+	+	+	+	+	+	+	+		+			+
Science Associate Prof.									+				
Health Associate Prof.	+		+		+	+		+		+			+
Protective Service Occs			+		+	+	+			+			
Culture/Media/Sport Occs	+	+	+	+	+	+				+			
Bus/Public Serv.Assoc Prof.	+	+	+	+	+	+				+			
Admin & Clerical Occupations													
Secretarial & Related Occs.	-												
Skilled Agricultural Trades													-
Skilled Metal/Elec Trades													
Skilled Construction Trades													
Other Skilled Trades													
Caring Personal Service Occs	+	+	+	+	+	+	+	+	+	+	+	+	+
Leisure/Oth Pers Serv Occs	+	+	+	+	+	+	+	+	+	+	+		+
Sales Occupations													
Customer Service Occupations													
Process Plant & March Ops	-												
Transport Drivers and Ops													
Elementary: Trades/Plant/Mach													
Elementary: Clerical/Service													

level of employment in 2001 and/or 2011 is 100,000 or greater

+ growth in employment between 1999 and 2010 is forecast to be 20% or greater

- growth in employment between 1999 and 2010 is forecast to be -20% or less

Blue growth in employment between 1999 and 2010 is forecast to be 10% or greater (row & column totals only)

growth in employment between 1999 and 2010 is forecast to be -10% or less (row & column totals only)

6.91 Regional variations in the projected changes are substantial. *Table 6.10* provides an overview. The shading and use of + and – signs in the cells helps to highlight which occupations are numerically important in different locations as well as which are growing or developing most rapidly. The shaded cells indicate employment of 100 thousand or more in either 2001 or 2011. This illustrates the dominance of London and the South East regions but also highlights the importance of particular types of jobs in other regions. The + signs indicate rates of growth of employment in excess of 20% over the period 1999-2010. Certain occupations are expected to achieve this in every region (health professionals, personal service occupations and leisure and other personal some occupations). Rapid job losses in excess of 20% indicated by the – sign, are limited to managers and proprietors in the northwest and skilled agricultural trades in Northern Ireland.

Healthcare, childcare and animal care occupations are projected to grow especially rapidly in the East and West Midlands.

6.92 The specific features within individual regions can be highlighted by focusing on the five most rapidly growing occupations. The most rapid growth is expected in caring and personal service occupations (e.g. in health care, child care and animal care) where a 46% increase is projected. However, the largest increases, of over 60%, are expected in the East Midlands and West Midlands with the slowest increases being in the North East (33%) and London (37%).

Health professionals are expected to see the most rapid growth in the East of England, North East and East Midlands.

6.93 The second fastest growth, nationally, is expected amongst health professionals (e.g. medical and dental practitioners) where a 39% increase is expected. However, the biggest increases are expected in the East of England (58%), North East (61%) and East Midlands (57%) regions. On the other hand, the regions expected to experience the slowest growth amongst health professionals are in the North West (27%) and South West (25%).

Demand for business and public service occupations is expected to grow fastest in London and the South East.

6.94 The third fastest growth is expected amongst business and public service professionals (e.g. solicitors, surveyors, accountants, social workers and architects) where a 37% increase is anticipated. Here the largest increases are expected in London and the South East (46% in each case) and the East of England region (40%). The slowest increases are expected in the North West (27%) and the North East (18%).

Leisure and other personal services also do well in the southern regions although not in London.

6.95 Leisure and other personal services (e.g. hairdressing, leisure occupations/ travel agents and sports) is another occupational group expecting significant expansion – 31% nationally. The most rapid growth here is expected in the East of England region (52%) with significant above average growth in the West Midlands (43%) the South East (40%) and the East Midlands (42%). Relatively small increases are expected in London (22%) and the North East (23%).

6.96 Another group expecting rapid growth (of some 30%) is culture, media and sports occupations (e.g. designers, media, sport and fitness occupations). Here regional variations are less marked, except that growth is limited in Yorkshire and The Humber (14%) and, especially, in the North East (5%).

6.97 It is worth noting that customer service occupations are expected to grow at only a modest rate overall – some 6%. This is the occupational group comprising largely call centre operations and telephone advisers and sales staff. There are however large regional variations in growth prospects with London expecting to experience a decline of nearly 9% (though on an already small occupational base). On the other hand, large-scale increases are anticipated in the West Midlands (17%) East Midlands (14%) and Yorkshire and The Humber (10%). However, the total numbers employed in these occupations are, it should be stressed, relatively small, accounting for less than half of 1% of total employment nationally.

6.98 There are also considerable regional variations in the patterns of declining occupations. The group that is expected to experience the most rapid decline nationally is managers in agriculture and services (e.g. managers in farming, forestry and fishing; shopkeepers and garage managers) where a decline of around 15% is anticipated. Regional variations, whilst not extensive, do occur with the most rapid losses expected in the North West (21%) and West Midlands (19%). Skilled agricultural trades are also expected to decline by around 12% with the biggest losses being in the South West (18%) East Midlands (17%) and the North West (18%).

Amongst declining occupations, some of the most rapid losses are for managers and proprietors in the North West and West Midlands and skilled agriculture trades in the South West and Northern Ireland.

6.99 Secretarial and related occupations (e.g. typists and receptionists) are expected to decline by around 9%. Significant regional variations are apparent, however, with the largest losses being experienced in London (22%). A small increase (2%) on the other hand is expected in the East Midlands. Process, plant and machine operatives are likely to experience a decline of around 8% with very large variations being expected across the regions. As many as 52% of all such jobs are anticipated to be lost in London, whereas small increases are actually expected in the South West (3%) and North East (1%).

Most of the operative jobs that are expected to be lost are in London.

6.100 Another occupational group where a significant decline in demand is expected to be experienced is in skilled metal and electrical trades (e.g. welding, machining, engineering fitting and vehicle trades). Regional variations are not as substantial as in other occupations but nonetheless range from a decrease of 13% in the West Midlands to an increase of 5% in the South East.

Regional variations in qualification trends

All regions are projected to see the share of jobs of qualified people in the workforce increase, but there is some variation across regions.

6.101 There are very considerable differences in the pattern of projected employment growth across the various qualification levels (*see Table 6.11*). The results provide some indication of changing qualification requirements within each region. However, it has to be recognized that such projections reflect supply as well as demand trends. The patterns in terms of trends are broadly similar across the regions but there are important structural differences, reflecting the different industrial and occupational employment structures.

These variations reflect the existing employment structure of the regions and their differing growth prospects.

6.102 The projections are driven by the underlying occupation employment structures of the regions and the different overall employment growth prospects anticipated. Trends in qualification structures within occupations reinforce these patterns. For example, substantial employment growth is projected for those with NVQ level 5 or equivalent (higher degree) qualifications at national level. The growth rate over the period to 2010 for the UK as a whole is 31%. Across the regions this varies from highs of 37% in London and 34% in the East of England and South East to just 20% in the West Midlands and 21% in the North East and Yorkshire and The Humber.

Existing concentrations of higher skilled jobs in London and the South East are projected to be reinforced.

6.103 Almost 50% of all employment at this level in England is concentrated in just 2 regions - London and the South East, and this share is expected to continue to rise over the next 10 years. At NVQ level 4 (first degree or equivalent) qualifications, a similar pattern emerges but with even wider variations - from a 42% increase in qualifications at this level in London to just a 23% increase in the North East.

6.104 In contrast, for those with NVQ level 3 or equivalent as their highest qualification, the changes projected are much more modest and in some cases negative. All these figures refer to those whose highest qualification is at that level. The increasing tendency for people to acquire even higher qualifications has resulted in only relatively modest changes here over the recent past compared to those expected for NVQ level 4 and 5. These patterns are expected to continue. At NVQ level 3, London is projected to see a small absolute decline with very modest growth in the North East. On the other hand, substantial increases are anticipated in the South East and the South West of around 14%. These are driven by changes in occupational structure in these regions. At NVQ level 2 or equivalent, actual reductions in qualifications at this level (10%) are expected in London and to a lesser extent in Yorkshire and The Humber, North West and the West Midlands. On the other hand small increases are expected in the East of England (5%) and South West (4%) in particular.

The numbers of jobs without qualifications are expected to fall in all regions.

6.105 London is also expected to see reductions in the share and numbers of those with NVQ level 1 or equivalent, whereas quite considerable growth is expected in both shares and levels of employment for all other regions. The numbers employed with no formal qualifications are expected to decline very significantly in all regions.

Prospects for the Supply of Skills

Projecting the supply of skills is even harder than predicting demand.

6.106 Projecting the demand for skills is difficult. Projecting supply is even harder. There is only very limited evidence about the future supply of skills. There are conceptual and practical problems of forecasting the supply of occupations or the supply of key and generic skills. Research in this area is therefore focused around qualifications rather than the various other measures of skill.

It is important to distinguish between stocks and flows.

6.107 It is important to make a distinction between the stock of people in possession of formal qualifications and the various *flows* into and out of this stock. Most of the data on stocks relate to the highest qualification held and focus on those in employment rather than the total number available with particular qualifications. These problems are reflected in what is available in the way of forecasts. Data on the *flow* of people through the educational system as they acquire formal qualifications are abundant, especially for higher-level qualifications. Information on many other aspects of supply is much more limited, including mortality rates and migration flows as well as economic activity rates (which provide an indicator of outflows due to retirement). Given the ease of geographical mobility such flows are also an important factor at country/regional level, especially for those with higher-level qualifications. However available data are very weak and so few serious attempts have been made to undertake projections at a regional level.

A variety of projections are produced but they are all fairly aggregate.

6.108 DfES makes projections of participation in higher and further education but these are not published in any detail. The Institute for Employment Studies has issued short-term projections of graduate output. The most comprehensive projections available, however, are those produced by the IER (Wilson, 2001a and 2001b). These focus upon higher-level qualifications (NVQ3+).

6.109 Differentiating demand and supply is far from straightforward, especially for lower level qualifications. The projections of 'demand' discussed above are subject to quite large margins of error. The results should therefore be regarded as indicative rather than precise predictions. It is also important to recognise that the projections usually make no allowance for any equilibrating mechanisms to bring supply and demand into balance although this is a basic assumption used for one of the main scenarios considered by IER (the balance scenario).

Demographic considerations suggest a decline in numbers...

6.110 Demographic considerations lie at the heart of any projection of supply. The population is ageing and the size of the cohort of young people who are the most active in acquiring qualifications is declining. The overall size of the 21 year old cohort fell by around a third between 1985 and 1998. This has meant a significant fall in the potential numbers available to acquire qualifications. The share of young people in the total population is expected to continue to fall over the next two decades.

but this is expected to be offset by rising educational participation rates.

6.111 Educational participation rates in Higher Education (HE) have risen steadily. The measure used by IER has increased from 5-10% up until the early 1980s to over 30% in the mid 1990s. Rates are likely to remain high (at least 35%

and possibly as high as 45% if the Government's target of 50% for the *Initial Entrant Rate* for those aged 18-30 year olds is met). As a consequence, numbers acquiring higher-level qualifications will continue to rise. Achievement of the Government's target for the increase in the *Initial Entrant Rate* will be dependent on policies relating to fees, grants and loans. Participation of other age groups in HE have also been rising, especially for mature students. These have been growing in importance and are expected to continue to do so.

6.112 Participation rates for young people in post-compulsory education have risen steadily and are approaching 100% for 16-18 year olds. Participation of other age groups in further education has also been rising, especially amongst more mature students. As a consequence, the acquisition of formal qualifications at NVQ levels 2 and 3 will continue to rise.

The acquisition of formal qualifications is projected to continue to increase, especially at higher levels…

6.113 At first degree level, currently around 250,000 a year are obtaining such qualifications. This could increase to over 350 thousands a year if Government targets for the *Initial Entrant Rate* are met. However the composition of this flow is changing and there are question marks about quality standards. Regarding subject mix, there is a continuing shift away from science and a move in recent years towards a more modular approach involving multiple disciplines.

6.114 If government targets for the *Initial Entrant Rate* are met by 2010, this could result in some 3 million more people in employment with degree level qualifications NVQ levels 4 or 5. Even on much more modest assumptions, an increase of around 1.5 million is anticipated.

but the impact on the stocks available with intermediate level qualifications will be modest.

6.115 The numbers acquiring NVQ level 1-3 have also been rising rapidly, reflecting the increased participation rates in post compulsory education. However, many go on to acquire higher level qualifications, so the impact on the stock of people with these as their highest qualification is not expected to changing greatly.

Females will show the most rapid increases.

6.116 As far as gender mix is concerned, the numbers of females acquiring formal qualifications have been increasing more rapidly than males at most levels. Women accounted for 50% of the total inflow of newly qualified people at NVQ level 4-5 in the late 1990s.

Migration is becoming an important consideration.

6.117 Until recently, net migration has not been of great significance. Since the early 1990s, from a position of balance, the numbers flowing in have outweighed inflows. Net migration appears to have peaked at just under 200,000 in the late 1990s. Just over 100,000 a year are currently coming into the country. This is greater than the "natural" increase resulting from births exceeding deaths. Generally immigrants are more highly skilled than the population as a whole. Migration therefore contributes positively to the stock of skills in the UK, especially for health service personnel (nurses and doctors). Migration could contribute as many as 250,000 extra people with NVQ level 4 or 5 qualifications between 2000 and 2010, if recent trends continue.

Labour market participation rates will also play a part.

6.118 Falling labour market participation rates (earlier retirement and increasing participation in HE and FE) have been a key feature for most groups. The typical retirement age for men has steadily fallen, with many now leaving in their 50s. In the case of women, activity rates for "prime aged" women have risen, but they have fallen for younger and older ones (for the same reasons

as for males). Women are expected to account for almost 50% of the work force by 2010. Further reductions in activity rates for older people seem likely although the Government is concerned about the implications for pensions. A larger proportion of women have also been retiring early but the government has introduced legislation to raise the official retirement age from 60 to 65, in line with men.

6.119 The total numbers of those economically active, holding higher level qualifications (NVQ levels 4 and 5) increased by over 2.5 million between 1991 and 2000. Overall numbers are projected to increase by at least a further 2.5 million over the present decade, increasing substantially their shares of the workforce. Outflows from retirement and mortality are far outweighed by inflows, especially of newly qualified entrants. Net migration may play an increasingly important role, especially for certain professions.

Stocks of persons with qualifications will rise substantially, especially at higher levels (NVQ levels 4 and 5).

6.120 Stocks of those with NVQ level 1-3 as their highest qualification are not modelled explicitly. However, the numbers acquiring such qualifications increased substantially between 1991 and 2000. This resulted in a net increase of around 3 million in the stock of people with NVQ level 1-3 as their highest qualification (over 2/3 of which is at NVQ level 2 or 3). Many go on to acquire even higher qualifications, therefore the stock holding NVQ level 1-3 as the highest qualification may decline, despite large (and even growing) numbers continuing to acquire such qualifications. Future stock numbers are therefore expected to change only slightly. The overall numbers with no qualifications fell by 3 million between 1991 and 2000 to around 3.6 million. Further, more modest, reductions are anticipated. The stock of those with no formal qualifications will continue to shrink. A rump of 1.5-2.5 million with no qualifications is likely to remain.

Future Skill Imbalances and Deficiencies

6.121 Respondents in ESS2002 were asked to identify which skills were likely to become more important over the next two to three years (Hillage, *et al*. 2002). All establishments reported that skill needs would change in at least one occupational area. In general, skill needs were expected to change in the future due to the introduction of: (a) working practices; and (b) new technology (both mentioned by just over half of all establishments). The key skills that were expected to become more important over the next three years were:

Surveys of employers also suggest that the needs for certain types of generic skills will increase significantly in the future, especially for IT skills.

- communication;
- customer handling;
- team working; and
- management.

Employers reported that the importance attached to customer handling skills stemmed from growing customer expectations.

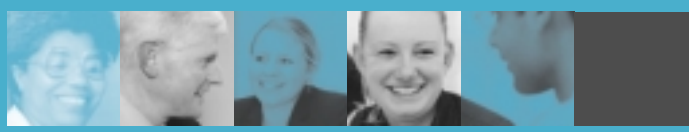
6.122 Follow up interviews were conducted with a small number of ESS2002 respondents to ascertain whether the skill needs they had identified were changing more quickly than the two to three year period specified. Most did not think that skill demand was changing more quickly; nearly all those who thought skills were changing at a faster pace referred to IT and other technical change, such as the introduction of e-commerce (Hillage, *et al*. 2002).

Table 6.11 Projected Employment by Qualification, 1999-2010

Region	Level 5		Level 4		Level 3		Level 2		Level 1		No Qualifications	
	1999 (000s)	% ch.	1999 (000s)	% ch.	1999 (000s)	% ch.	1999 (000s)	% ch.	1999 (000s)	% ch.	1999 (000s)	% ch.
London	328	36.9	1123	42.4	615	-1.0	834	-9.7	802	-8.4	433	-25.4
South East	173	34.1	866	38.9	750	14.1	906	2.1	844	10.9	405	-17.8
East of England	100	34.0	468	38.5	445	8.8	592	5.1	564	9.6	271	-10.3
South West	92	33.7	499	33.1	440	13.6	533	4.1	511	12.9	236	-30.9
West Midlands	86	19.8	438	30.1	433	4.4	558	-0.7	541	10.2	390	-41.3
East Midlands	59	30.5	344	30.8	387	5.4	410	0.7	433	13.6	262	-26.0
Yorkshire & The Humber	86	20.9	436	26.2	402	6.7	496	-2.0	505	13.9	307	-25.4
North West	107	29.0	603	28.2	586	2.7	683	-1.8	618	7.6	383	-36.0
North East	29	20.7	184	22.8	204	0.5	237	0.0	230	11.3	141	-34.0
United Kingdom	*1237*	*30.8*	*5864*	*33.2*	*5099*	*5.4*	*6172*	*-0.9*	*5778*	*8.2*	*3388*	*-26.5*

Source: *Wilson (2001b) Table 14, Page 19.*

Chapter 7: Key Challenges



Chapter 7

Key Challenges

Overview and Summary

7.1 This final chapter presents a summary of the conclusions and key messages which emerge from the *Skills in England 2002*. These include a number of ***Key Challenges*** facing those concerned with education, training and skills.

7.2 Perhaps the most important message, although it is not a new one, is that skills matter. They matter for individuals, for whom investment in skills can increase earnings and productivity, as well as improving the chances of obtaining and retaining employment. They matter for organisations, where they can make the difference between success and failure. They matter for society as a whole, with considerable evidence that both economic and more general social well-being are dependent on appropriate investment in education, training and skills.

Skills matter to individuals, organisations and society in general. Investment in skills can reap great rewards.

7.3 There are however a number of key problems and challenges that emerge from the *Skills in England 2002* which still need to be addressed if these potential benefits are to be secured.

However, a number of key challenges remain to be addressed if these benefits are to be attained.

7.4 The first general set of challenges relates to whether or not supply side policies, designed to raise the skills base, are working. There are some doubts about whether the expansion of higher education has produced the skills needed. To date, the increased number of graduates at NVQ levels 4 and 5 have been absorbed without significant evidence of declining rates of return to such investment. However, employers and others have continued to question whether or not the balance is right.

Have supply side policies resulted in the right mix of skills for the 21st century?

7.5 While the changing patterns of demand for skills, including the different proposals for particular sectors and occupations, are fairly well understood, the need to recognise the importance of replacement demands remains a challenge. It is a challenge for employers in such sectors, trying to recruit and retain the staff they need, as well as to education and training providers to make young people better aware of the attraction of such job opportunities.

Recognising the importance of replacement demands in declining sectors is a challenge...

7.6 The evidence on changing demand patterns, including replacement demands, helps in the identification of the areas where further investment in skills is desirable. Other pointers can be taken from estimates of rates of return. These suggest that there is still considerable room for further investments, especially in certain vocational areas and for certain basic skills. The need to place greater emphasis on various key and generic skills, as well as technical and academic ones, also poses an important challenge for education and training providers.

7.7 Measures to improve employability, especially for those who have tended to lose out in the acquisition of skills so far, is another major challenge. This is made especially difficult by the fact that, in many cases, there remains a very unfavourable attitude towards learning amongst those at the greatest disadvantage.

as is improving employability when attitudes to learning remain poor.

However, the main challenge may be to boost demand rather than increase the supply of skills, in order to avoid the trap of a low skill equilibrium.

7.8 Perhaps the most important challenge is to recognise and address the possibility that the real problem is the failure of many employers to recognise the importance of skills. This can result in a lack of demand, since such organisations may fail to realise the potential benefits of investment in skills that might arise, as part of a product strategy based on improving product quality rather than simply competing in terms of cost and price. This is tied up with the notion of many sectors, in certain parts of the UK, slipping into a so-called low skill equilibrium.

7.9 This suggests that one of the major challenges facing the LSC and other bodies, including the SSDA, is to stimulate the demand for skills rather than supply. This may require new research to help identify the best way of achieving this objective.

7.10 The chapter continues with a brief overview of a number of other important issues which emerge from the more detailed sectoral and local analysis covered in Volume 2 of the *Skills in England 2002*. These include:

- the need to influence supply side policies to ensure that education and training providers recognise the needs of employers more effectively, especially in increasing emphasis on generic skills;
- the recognition of a number of geographic disparities in the demand for and supply of skills, especially, but not solely, related to problems of the public sector in London;
- the problem of polarisation of skill demands in particular localities; this includes the need to deal with the disparities between the 'skill rich', who are benefiting from the structural changes taking place, and the 'skill poor', who are being displaced or bypassed by the pace of change. As already noted, this may require major changes in attitudes to learning; and
- the recognition that to change the skills held by the workforce in 2010 requires as much emphasis on the existing workforce as on new entrants to it. This also implies a need to address the problems faced by smaller organisations who account for a large part of this workforce, but who tend to train less frequently and less intensely.

7.11 The chapter concludes with an overview of priorities for further research. This includes the need for:

- continued improvements in the statistical database;
- ongoing projections of changing employment structure;
- regular monitoring of rates of return to education and training;
- detailed sectoral and local analysis;
- further research on generic skills; and
- exploration of the low skill equilibrium problem.

Skills Matter

This chapter outlines the key challenges facing skills policy.

7.12 Much is now written about the creation of a 'knowledge economy', reflecting the fact that the workforce will increasingly compete on the knowledge it brings to the production or service process. Whilst this suggests that England (and the UK) will increasingly compete on the skills of the existing labour force, questions remain about the types of skill to be invested in and who should bear the risk of that investment.

The first key message is that skills matter. They are essential to raising organisational performance and national competitiveness.

7.13 Perhaps what ought to be said first is that **skills matter**. There is now a wealth of evidence that demonstrates that the acquisition of skills by either individuals or employers is associated with higher earnings, increased productivity and greater job security. The State also benefits in a number of ways, as the social rates of return analyses illustrate. Civil society appears to benefit from a more educated population, much as high-minded 19th century utilitarians like John Stuart Mill had hoped.

However, investment in skills is not free from risk.

7.14 Investment in skills is not free from risk. Individuals, employers, and the State are required to make judgements about where to invest their time and money, but there is no certainty that training to acquire particular skills will yield the expected rate of return. Whilst there is consensus about the value of skills, there is much less about who should bear the risk of the skills investment (the State, the individual, or the employer) and how the return to that investment should be distributed (*e.g.* the debate about graduate loans and graduate tax).

7.1 Although the investments made in education and training over recent years have been repaid with rich dividends, a number of key challenges remain. These are outlined in the remainder of this chapter.

Key Challenges

Are supply side policies working?

7.16 England has undergone an almost unprecedented growth in post-compulsory education participation rates over the past two decades, with a consequent growth in the number of those in possession of formal qualifications. Though some uncertainty is still attached to the outcomes of these developments, evidence is beginning to emerge about where skill needs are still not being met, where skills are being wasted, and on those who have missed out on the expansion of educational opportunities.

While the expansion in educational participation has been generally welcomed, some concerns have been expressed that it may have gone too far.

7.17 The *Skills Survey 2001* reveals evidence about the over-supply of qualifications. This needs to be set in context. Given the pace of growth in post-compulsory education participation rates and educational attainment it is far from surprising that some employees report that the qualifications they possess were not required to obtain their current job. It will take time for employers to appreciate that applicants for jobs are more highly qualified than hitherto. Similarly, it will take employers time to work out how the potential embodied in those with qualifications can be unlocked for their organisations.

7.18 Individuals, especially on their initial entry into the labour market, take a variety of routes. First jobs, for example, may not reflect an individual's career choice or make use of the qualifications and skills the individual possesses. Individuals may take their time to find their preferred occupation. In this sense there will always be a substantial number of people who are temporarily occupied in jobs which do not appear to make full use of their qualifications.

However, investment in qualifications and skills continues to result in positive returns...

7.19 The most convincing evidence against over-qualification appears to be that of relative wage rates over time. Positive rates of return are associated with possession of most qualifications. The available evidence suggests that these have remained constant over recent years. If one accepts that an individual's wage is equal to their marginal productivity, then there appears to be convincing evidence that, in general, employers are making good use of the additional stock of qualified people now available to them.

although many employers remain unconvinced that mix of skills is right.

7.20 The evidence, overall, reveals that education and qualifications pay. That said, and as will be commented on later, employers still report that, often, they cannot obtain the skills they require and that students coming out of the education system are not as vocationally well prepared as they would like. Moreover, at an aggregate level, concerns still remain about the relative productivity of the British workforce.

Where is the demand for skills?

7.21 Employers surveys, quantitative projections and other evidence, all point to continued changes in the pattern of demand for skills, contingent on further structural and technological changes affecting the prospects for sectoral and occupational employment levels.

Changing patterns of demand will benefit certain occupations and sectors, while others continue to decline.

7.22 The growth in new jobs is expected to be concentrated in managerial, professional, and associate professional jobs, the so-called higher level occupations. In other words, much of the projected employment growth will be in high skill intensity jobs, entry to which requires a high level of educational attainment. Employment growth, however, will also be concentrated in personal service occupations, where the level of skill input is often quite modest. So whilst a large component of employment growth will be skill intensive, a substantial part of it will not.

7.23 It is tempting to try to 'pick winners', concentrating resources on industries or occupations exhibiting strong employment growth or those that are projected to do so in the future. All the evidence, however, points to replacement demand being far more significant as a source of job openings than, say, projected increases in employment growth. Replacement demand, which includes the need to replace those leaving their jobs for reasons of retirement, can be substantial even in those parts of the economy in long-term decline.

7.24 A substantial proportion of replacement demand is concentrated in traditional, declining sectors of the economy, where the skill intensity of work is often quite low. The major challenge here is how to persuade people to acquire the skills and to seek employment in industries or occupations that are expected to continue to decline. It is noticeable that a large share of hard-to-fill and skill-shortage related vacancies are associated with skilled trades jobs, typically concentrated in the manufacturing and construction sectors, and stemming in large part from replacement demand. It is not uncommon to hear employers in some declining sectors say that young people are not particularly interested in entering their industry because of their history of redundancies and the message this sends out about job security. The danger is that the long-term decline of these industries is hastened by the problems of recruitment and skill development.

However, there is a need to recognise that there is a strong replacement demand for skills in many declining sectors of the economy. Making such jobs attractive to young people is a major challenge.

7.25 A large part of replacement demand is due to retirement from the workforce. Another significant component is a consequence of people leaving an organisation to seek work elsewhere, possibly in another industry or occupation. Levels of wastage, that is the number of people leaving an organisation each year, are high in some industries. Simply increasing the supply of skilled people without addressing how organisations or industries might better retain their existing stock of skilled employees will be unlikely to have the desired effect. As well as looking at employers' skill needs from a demand perspective, more attention needs to be paid to staff retention.

A further challenge is to find ways of reducing levels of turnover, which, in many industries, are a key source of replacement demands and a disincentive to training. Turnover can be reduced by engaging in more substantive skills training.

7.26 Labour turnover is a disincentive to employers to train, since those who bear the cost of training do not enjoy its benefits. Offsetting future recruitment problems and avoiding potential skill gaps is dependent upon employers training and developing their workforce. High labour turnover appears to stand in the way of achieving this end. Clearly, a key challenge is to persuade employers who do not engage in substantive skills training to do so. But given that the determinants of labour turnover are manifold and related to a wide range of terms and conditions of employment, it demonstrates that workforce development strategies need to be holistic, if they are to achieve their end of promoting the continuous development of the workforce. Holistic in this respect means that training and development needs to be seen as part of a wider set of issues related to the terms, conditions, and quality of employment.

Workforce development cannot be considered apart from the wider set of terms and conditions of employment.

Where to invest in skills

7.27 The evidence on rates of returns to education and training, suggests that there is still considerable scope for investment by both individuals and the State. It is less clear on precisely where such investments will bear the greatest returns. Inevitably, such analyses tend to be retrospective rather than forward looking. This is probably impossible to remedy. More can be done perhaps to highlight particular areas where the State should encourage individuals and employers to invest. The evidence reported in Chapters 1 and 5 suggest that it is already clear that greater investment in basic skills is likely to be fruitful. The balance between academic and vocational courses is perhaps less clear cut but, again, the evidence suggests there is considerable scope to expand investment in more vocational areas and to provide better

Rate of return evidence suggests further investment in basic skills and vocational qualifications as well as higher level qualifications is likely to be rewarded.

information to potential investors about the prospects in these areas. It is unrealistic to expect such analysis to provide precise and detailed pointers about the relative merits of particular courses. Nevertheless, there is probably considerable scope to provide more detail than is currently available.

Certain generic skills are effectively obtained through work experience. Some employers will only recruit people who possess these skills. This poses a challenge to education and training providers to fill this gap.

7.28 The evidence points to the skills base improving over time, at least as far as qualifications are concerned. Despite this, employers continue to complain that they cannot find people with the skills they are searching for. Research evidence points to employers often looking for a combination of technical skills (or the capacity to obtain those skills through training) and more generic ones. The types of generic skills required are often 'key' or 'basic' skills related to communication, numeracy, literacy, capacity to work with others, customer handling, etc. It is not just in relation to so called 'lower level jobs' that generic skills are thought to impede recruitment, but also in relation to so-called graduate entry jobs. Generic skills of the type mentioned above are, arguably, best obtained through work experience. Yet some employers appear often unwilling to recruit people who lack these skills. There is an apparent "Catch-22" here. A further challenge for education and training providers, therefore, is how to ensure that those acquiring formal qualifications also obtain the other types of skills which employers apparently value highly.

It is important not to lose sight of the importance of fundamental technical skills as well.

7.29 Survey evidence tends to place great emphasis on such generic and key skills rather than more technical skills. This may reflect the way such questions are put. It is important not to lose sight of the importance of the technical skills. It is desirable that surgeons should have a good bedside manner and that car mechanics are articulate. However, the technical skills that they require to undertake their jobs are of even greater importance.

Improving employability

The English education system is still not providing as much vocational preparation as its main competitors.

7.30 Improving **employability** is dependent upon providing work experience or work-based training to develop skills related to customer service, customer handling, communication, working with others, etc. The evidence suggests that the English education system still does not provide as much vocational preparation as other countries, such as Germany, for example, with its dual system of apprenticeship training that emphasises work-based learning and experience alongside classroom teaching.

Training opportunities remain unequally distributed throughout society. A key challenge is for training opportunities for the most disadvantaged in society to be improved.

7.31 Post-compulsory education and training opportunities are unequally distributed across society. Individuals higher up the occupational ladder and in possession of higher level qualifications are much more likely to receive training. Unemployed people are much less likely to be in receipt of training. At a time of near full employment, those that remain unemployed for a long period of time are likely to suffer from a range of disadvantages that severely damage their employability. The evidence suggests that long-term unemployment is associated with poor educational attainment and a lack of numeracy and literacy. A key challenge is to ensure that training opportunities are distributed so that those lower down the occupational ladder, or those out of work, are able to access training and development that will improve their employability and foster their career development.

7.32 Following on from the discussion of employability and access to training, it is apparent from the local evidence presented in this report that recruitment problems often co-exist with relatively high levels of unemployment (although the unemployment rate measured by the claimant count is historically low across England). The evidence suggests that most unemployed people do not possess the skills (either technical or generic) required by employers. The challenge of re-connecting the longer-term unemployed with the world of work is a formidable one.

The challenge of re-connecting the longer-term unemployed with the world of work is especially formidable.

A low skill equilibrium?

7.33 To date, the principal policy mechanism for raising the level of skills, organisational performance, and national economic performance has been supply-side dominated. The growth of post-compulsory schooling educational participation rates has been both massive and rapid. Consequently, the percentage of individuals with qualifications has grown substantially.

The main policy tools are supply-side oriented. More attention needs to be paid to stimulating the demand for skills.

7.34 At the time of writing the UK has achieved the goal of near full-employment. There is some variation by local LSC but this is quite limited. Though labour demand is buoyant, questions remain over the nature of that demand. Research conducted on latent skill gaps has suggested that they are widespread. That is, employers are often not aware of the skills that they need to raise the performance of their organisations to the level of the better performers in their market. This undoubtedly lies behind the poor productivity record of the UK economy compared to some of its main competitors. There is *prima facie* evidence that many organisations in England (and the UK) have settled into a relatively **low-skill equilibrium,** in which they concentrate on cost and price rather than product or service quality. A key policy challenge is how to change this into a virtuous circle: one in which investments in skills enable improved competitiveness on quality grounds and increased value-added, and factor incomes.

Latent skill gaps are widespread. Many employers are unaware of the skills needed to improve their performance to the level of the better performers in their market. A key policy challenge is to break the vicious circle of low skill equilibrium into which many organisations have slipped.

7.35 The question of whether or not the British economy suffers from being trapped in a low skill equilibrium has been debated for over a hundred years although the discussion was given new impetus by the analysis of Finegold and Soskice (1988). More recently this question was in many ways at the centre of the discussion instigated by the National Skills Task Force. The NSTF (2000) recommended a major new Employer Skills Survey (ESS), and related case study research, which DfES commissioned in 1999, (Hogarth and Wilson, 2001). One of the main aims of this work was to explore employer product strategies and their links to skill problems.

7.36 The low skill equilibrium hypothesis posed by Finegold and Soskice (1988) was essentially one about the relationship between education/training institutions and employers. Put crudely, the low level of skill demand from employers and the low level of skill produced through the education and training system fed off one another. Since then there have been manifold changes in the institutional arrangements to deliver skills in the labour market. Most of these institutions are principally supply-side oriented, but with the development of workforce development teams by the RDAs and LSC, organised on an industry basis, and the emergence of the newly formed SSDA, there are signs that policy is less supply-side oriented than it once was.

Recent institutional reforms have begun to focus more on the demand side of the problem.

The low skill equilibrium phenomenon would appear to have an important regional dimension.

7.37 Recent policy emphasis, including the Treasury's various publications have focused on the link between productivity and skills and the need to raise the latter, at both a national and regional level, in order to create a high wage, high skill economy. Nevertheless, SKOPE's Skills Survey 2001 (Felstead *et al*, 2001), shows that there is a substantial, and in some regions, growing demand for low and unskilled work. Other research on regional labour markets has suggested that a low skills equilibrium may be common in some regions outside the South East and London. In a number of areas, there are concentrations of low wage, low skill jobs and higher than average proportions of the workforce have low or no qualifications.

7.38 The use of the term equilibrium may be rather inappropriate, since this places the emphasis on a rather static approach, whereas the phenomenon at the centre of this debate is essentially a dynamic one. The key question relates to the conditions necessary to convert a vicious circle (of deprivation, lack of investment in skills and other capital and declining economic performance) into a virtuous circle (of investment in education, skills and other forms of human and physical capital and competitive success and economic growth). A second important issue is to address the concern that decisions on skill creation and usage (that are both rational and optimal from the perspective of the individual firm) can, at the aggregate level of the economy as a whole, prove sub-optimal in the long-term.

The links between competitive success and the utilisation of skills are complex, and greater understanding of the mechanisms involved is needed in order to break out of the current situation.

7.39 It has been a key concern for many years that British producers have often tried to compete on the basis of cost and price rather than value added and quality. The detailed results from ESS, summarised in Hogarth and Wilson (2001), suggests that there are key links between competitive success and the use and deployment of skills. These links are, however, complex and not unidirectional. The existence, relevance and accessibility of key skills, especially at management level, can be a crucial factor determining business strategy and commercial success. However, there is no simple magic formula which guarantees success. A complex and subtle mix of policies, as well as chance, all play a role.

7.40 Some have argued for a continued supply side initiative to raise the quality of skills available, and to relax any constraints that may at present be holding employers back. Indeed, most of the solutions proposed to low skills equilibria so far have been supply driven and based on increasing the proportion of the workforce with NVQ level 2 and level 3 qualifications (a range of pilots, initiatives and targets is already in place). However the results from the ESS research do not really support the notion that lack of skills is the key factor (Hogarth and Wilson, 2001). Although there are important skill deficiencies, as well as gaps in the skills available in the existing work force, these affect only a relatively small part of the economy.

Stimulating the demand for skills

7.41 There is an important strand of debate which argues that the real problem is lack of demand by employers. Many are not sufficiently ambitious in terms of target and goal setting, choosing instead to adopt the safer option which may not have a long term future. An important concept here is one of latency. One aspect of this is the notion that many employers may be unaware that they have significant skill deficiencies in terms of their existing workforce. They fail to realise that lack of skills, especially at a senior management level, but also at other levels within the company, may be limiting their capacity to compete and indeed survive in the market place. Were they to better appreciate this situation, this might reveal other aspects of latency. There is evidence that once firms try to change their strategies and adopt new ones based more upon product enhancement and competing on quality rather than price, this leads to further increases in the skills required of their workforce. Felstead *et al*. (2002), note that, whereas there are now only around 3 million economically active people who possess no qualifications, there remain over 6 million jobs for which no qualification is required for entry. This aggregate imbalance suggests that the key deficiencies in the use of intermediate-level qualifications in Britain (by comparison with other countries) may be deficiencies of demand rather than of inadequate supply.

There is evidence that, in an important sense, the demand for skills from many employers is inadequate if they are to succeed in an increasingly competitive environment.

7.42 There have been various demand driven approaches to breaking out of low-skill equilibria. Some of these are based on product market strategies in key businesses or sectors. Others have been based on support for innovation or IT across a broad range of sectors, on cluster development or business starts. These are all largely top down strategies, designed to raise demand for higher-level skills at the expense of lower skilled work. It may be necessary to operate at a more micro level, persuading individual employers to raise their sights and their game.

Individual employers need to be made more aware of the substantial benefits that a more skilled workforce can bring.

7.43 It is important not just to focus on marketed goods (and services), but also on traded versus non-traded goods. Much of the debate about increasing inequality in Britain and the US has been about how it has been influenced by skill-biased technical change and/or the increasing trade with low cost developing countries. The evidence appears to favour the former over the latter – all industries have seen increases in inequality, rather than just those that trade and compete internationally with low-skill and low-wage economies elsewhere. However, in terms of low skills, there have clearly been industries that have all but disappeared under the global onslaught of cheap labour in the production of manufactured goods. The problems such organisations face is likely to get more difficult, as trade increases, Europe expands eastwards, and the minimum wage begins to have more bite.

7.44 On the demand for skills issue, it is also worth emphasising the increasing importance of Workforce Development within organisations, which many now see as a key to competitive success. This is premised on the idea of the failure of the education system, including universities, to provide the supply of the kinds of skills that employers say they want. Together with the lack of appreciation of the importance of skills by many employers, this means that the onus should now be placed more on making them more aware and then

Employers need to play a greater role in developing the skills of the workforce that they say they require.

encouraging them - supported by Government - to develop the training schemes needed for the skills they require.

The links between employers and the institutions charged with developing skills need to be enhanced.

7.45 Analyses of Britain's relative productivity performance compared to its main competitors in the OECD indicate that educational attainment may play an important performance enhancing role. With respect to organisational performance, Coleman and Keep (2001) indicate that skills are still often considered a fourth or fifth order consideration. Addressing whether Britain has a low skill equilibrium is less about measuring the effect of educational attainment (or skill levels) on relative economic performance, and much more about understanding how the various institutions charged with developing skills interact with employers to raise the deployment of skills. In attempting to understand the existence of a low equilibrium it is important to address the extent to which current institutional arrangements stimulate, other things being equal, skill development and deployment in the economy. The role of a range of policy interventions at a national and regional level – from the DfES, DTI, Treasury, RDAs, and the LSC – need to be considered and assessed, in order to identify the effectiveness of particular actions being pursued at a national, regional, local or industry level.

7.46 A related question is how effective these institutions and their actions are at stimulating skill development within their target group. Large employers with sophisticated human resource development policies are already well integrated into the regional development community. What is of more interest is the capacity of policy initiatives to reach employers outside this 'golden circle' who are known to operate in relatively low value-added segments of their particular market. This raises the question about what comparisons are relevant. In the case of the hospitality industry, for example, it is a fairly pointless exercise to compare luxury, five star business hotels with small, seaside holiday ones. They are clearly operating in two different markets. What is needed is a more focused comparison between relatively high-and low-value added organisations operating in similar product markets to gauge the role of policy in practice to raise the performance of them both. This needs to involve new targeted and detailed case study analysis if one is to end up with more than platitudes.

Another key challenge is to raise the demand for skills by making employers more aware of their value

7.47 It can be argued, therefore that a further key challenge is to raise the demand for skills by making employers more aware of how these impact on organisational performance, productivity, and competitiveness.

Issues at Local and Sectoral Levels

The number of people with qualifications has never been higher yet employers' skill needs are still not being met.

7.48 According to both detailed sectoral and local evidence, the most pressing problem in relation to supply-side policies is that employers skill needs are often still not being met. Recent developments, with the creation of the Sector Skills Councils (SSCs) and the Sector Skills Development Agency (SSDA), are designed to ensure that future skills needs of industry are met. Currently, higher level skills are being supplied but, as noted above, employers complain that many potential new recruits lack a range of skills required to secure employment. There is an apparent paradox: on the one hand, there is considerable evidence that employers are having difficulty in finding the skills they need (despite the extent of latent skill gaps), yet the qualifications held by individuals in employment has never been higher. This suggests quite strongly that more qualifications are neither necessary nor sufficient to meet the skill needs of employers.

There are also a number of challenges to deal with geographic disparities in the demand for and supply of skills.

7.49 A particular challenge faces certain parts of the country, especially London. This relates to the problem faced by the public sector (and also some private sector employers) to recruit and retain the staff they require in the face of high costs of living. The difficulties faced by such employers are highlighted in many of the detailed local and sectoral studies. In the main, the long-term solutions to these problems seem to lie with employers themselves rather than in any attempt to try to remedy such problems by boosting the supply of newly qualified entrants by increasing education and training flows.

Dealing with the polarisation of skills caused by continuing structural change will also pose many problems.

7.50 A key challenge emerging from much of the detailed sectoral and local analysis is the need to cope with the polarisation in skill demands. Continued job losses in primary and manufacturing industries combined with rapid growth in many service industries, is resulting in a rapid loss of jobs for certain skill types and rapid growth in others. The new jobs are often in 'advanced' industries and require high level skills, especially IT skills. The skills of those displaced rarely match the required profile. In many localities a gap is emerging between the advantaged and disadvantaged groups created by these dynamics.

The main effort, if skill levels are to be increased, will need to be focused on the existing workforce.

7.51 Most ongoing training over the next few decades will inevitably have to be focused on those already in the workforce, rather than new entrants. This places a particular challenge on employers to make sure that their existing workforces have the skills they need to undertake their jobs effectively. This is especially problematic in areas such as IT where things are changing so rapidly but it also applies more generally.

Helping small organisations to recognise and meet their future skill needs will be another key challenge.

7.52 Another key challenge identified in much of the local research relates to the fact that, across all sectors, larger firms appear to be better at both identifying and addressing skills-related problems. It is clear that serious difficulties remain in addressing the problems small firms have in obtaining access to training. Given that much of the growth in employment over the past decade has been in small and medium-sized enterprises, this is an important finding for policy makers concerned to improve the skillsbase of the economy.

7.53 Those who are acquiring the relevant skills are frequently those who are already relatively skill rich. Quite frequently there is a significant disparity between the skills required and those available in the local workforce, resulting in inward commuting. This is especially a feature of the London labour market but also applies to a number of other metropolitan areas.

Targeting and assisting those who remain skill poor will be a key challenge for many education and training providers.

7.54 A number of local LSCs have noted that there is marked segregation of many labour markets. In particular, there is frequently a broad divide between high level occupations and sectors and low level ones. This suggests an important challenge for policy makers to target low skilled individuals in order to help them to break out of such vicious circles.

This will include the need to change attitudes to learning, which remain negative amongst many groups.

7.55 Such interventions clearly involve addressing the issues of learning and attitudes to learning as factors in social exclusion. In many cases, those who most need training and enhancement of the stock of their existing skills have the least positive attitudes towards learning. Major changes in attitude in order to meet the challenge of developing a 'learning culture' are needed in many areas. Such changes in attitude are required not just of disaffected youth but also of existing employees, the self employed and employers.

Research Gaps

The National Skills Taskforce initiated a number of research initiatives.

7.56 The National Skills Task Force stimulated a wealth of research, the legacy of which this and the last Skills in England has benefited from. Much of that evidence will be out-of-date for policy purposes by the time of the next Skills in England Report.

7.57 A number of areas of research can be identified where it is important to have consistent data at regular intervals (although not necessarily annually). These are highlighted below.

7.58 National data are required. It is essential, especially when looking at issues of competitiveness, to have a UK picture. Areas such as Northumberland and Cumbria will be in competition along their borders with their neighbouring Scottish regions; similarly along the English-Welsh border. Without a UK picture, or at least one for Great Britain, only a partial picture of skills development can be obtained.

These need to be continued, with new research focused on sectoral and local problems...

7.59 Comparative data are required. Ideally, any local LSC needs to know, depending upon the subject, how it compares to neighbouring local LSCs, to its regional average, and the national average (bearing in mind the point made above that for some purposes the nation is the United Kingdom not England). Similarly, individual industrial sectors need to know how they compare to broad industrial groups in which they are located, as well as the national average across all industries. This requires central co-ordination of data collection.

as well as continuation of existing data series.

7.60 Consistent time series data are required. Ideally, information is required on change over time so that it is possible, for example, to discern the impact of the economic cycle on skills needs. Given the amount of investment in skills taking place, and recognition that the impacts are likely to be felt over the

medium to long-term, there is a need to measure change over time. Little is known about the seasonality of skills demand.

7.61 Timely quantitative projections are an important part of the picture. The current series used in this document will soon become outdated.

This should include regular employment projections...

7.62 Despite much recent research, relatively little is known about the concept of generic skills. If skill is defined as a property acquired through learning it is not always clear whether some generic skills are really skills or just personality traits.

work on generic skills...

7.63 Analyses of the private rates of return are essentially estimates of the benefits of an added year of education or the acquisition of an additional qualification. In this sense they are not about the rate of return to the acquisition of skills, since these might not be accredited, and possession of a qualification does not necessarily infer competence. Further research on the direct value of skills is needed.

as well as monitoring of rates of return.

7.64 Relatively little is known about the relationship between skills, training, and productivity (or organisational performance). The Learning and Training at Work surveys record a huge volume of training taking place each year, but little is known about the effectiveness of that training.

Other more fundamental research is also needed...

7.65 It is almost *de rigeur* to make mention of the low skill equilibrium in skills reports these days. The original hypothesis was appealing, but speculative. An important question is still in need of an answer: does Britain suffer from a low skill equilibrium? Of course the question will need to be broken down into a more manageable set of research questions, but it is still worth pursuing.

including further exploration of the concept of latent skill gaps and low skill equilibrium.

A Final Word

Continued monitoring of the new institutional arrangements and policy initiatives is important in order to ensure future economic success based on a skilled and integrated workforce.

7.66 England has experienced substantial changes in the institutional arrangements charged with the provision of skills, vocational preparation, and workforce development over recent years. Concomitant with this has been significant changes in the direction of policy, particularly the emphasis on participation rates and educational attainment targets. Inevitably, the impact of these changes on organisational performance at the level of the employer, and on economic performance at the level of the State, will be felt over the medium to long-term. Ultimately the performance of the economy is dependent upon the knowledge and skills embedded within it. The risks attached to getting the policy mix wrong are significant and require the system and policy to be continuously monitored to ensure that a socially inclusive and economically successful end is achieved.

Annex A: Classification of Skills

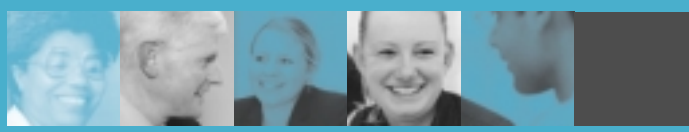


Table A1 Classification of Qualification Attainment Levels

Level	Typical qualifications	
NVQ level 1	GCSE below grade C;	GNVQ foundation;
	4 or less GCSEs (grades A-C);	City and Guilds
	CSE below grade 1;	
	1 AS-level	
NVQ level 2	5 or more GCSEs (grades A-C);	GNVQ intermediate;
	2 or 3 AS-levels;	RSA diploma;
	1 A-level	City and Guilds craft
NVQ level 3	4 or more AS-levels;	GNVQ advanced;
	2 or more A-levels	RSA advanced diploma;
		City and Guilds advanced craft;
		ONC, OND, BTEC national
NVQ level 4	First degree;	RSA higher national diploma;
	Diploma in higher education; Teaching; other degree	HNC, HND, BTEC higher; Nursing
NVQ level 5	Higher degree	

Source: *NSTF (2000a).*

Table A2 International Standard Classification of Education (ISCED)

Educational level	Details/age range	Common terminology	Classification
Early childhood education	Introduction of pre-school children to a school-type environment, from age 3	Pre-primary, nursery, kindergarten, pre-school	ISCED 0
Primary education	First stage of basic schooling, up to age 11 or 12	Elementary school	ISCED 1
Lower secondary education	Second stage of basic schooling, up to age 14 or 15	Junior high school	ISCED 2
Upper secondary education	Stage leading to final secondary qualification, typically age 18 or 19	Senior high school, Lycee, Gymnasium, Sixth form, Further education	ISCED 3, ISCED 4
Tertiary education	Programmes significantly more advanced than upper secondary studies	Higher education, College education	ISCED 5A, ISCED 5B, ISCED 6
University level education	Studies leading to a first degree, at least bachelor's level or equivalent		ISCED 5A, ISCED 6

Source: *OECD (2001a).*

Table A3 Standard Occupational Classification 2000

Skill level	SOC	Description
Level 4	11	Corporate managers
	21	Science and technology professionals
	22	Health professionals
	23	Teaching and research professionals
	24	Business and public service professionals
Level 3	12	Managers/proprietors in agriculture and services
	31	Science and technology associate professionals
	32	Health and social welfare associate professionals
	33	Protective service occupations
	34	Culture, media and sports occupations
	35	Business and public service associate professionals
	51	Skilled agricultural trades
	52	Skilled metal and electrical trades
	53	Skilled construction and building trades
	54	Textiles, printing and other skilled trades
Level 2	41	Administrative and clerical occupations
	42	Secretarial and related occupations
	61	Caring personal service occupations
	62	Leisure and other personal service occupations
	71	Sales occupations
	72	Customer service occupations
	81	Process, plant and routine operatives
	82	Transport and mobile machine operatives
Level 1	91	Elementary occupations: trades, plant and storage related
	92	Elementary occupations: clerical and services related

Source: *Elias et al. (1999).*

Notes:

1. *Skill level 1 equates with the competence associated with a general education, and is signalled via a satisfactory set of school-leaving examination grades.*
2. *Skill level 2 covers a large group of occupations, all of which require the knowledge provided via a good general education as for occupations at the skill level 1, but which typically have a longer period of work-related training or work experience.*
3. *Skill level 3 applies to occupations that normally require a body of knowledge associated with a period of post-compulsory education but not to degree level.*
4. *Skill level 4 relates to what are termed 'professional' occupations and managerial positions in corporate enterprises or national/local government. Occupations at this level normally require a degree or equivalent period of relevant work experience (Elias et al., 1999).*

Table A4 Description and Classification of Job Activities in the *Skills Surveys*

The questionnaires are worded as follows:

> "You will be asked about different activities which may or may not be part of your job. We are interested in finding out **what activities your job involves and how important these are**."

	In your job, how important is ...
1	... paying close attention to detail?
2	... dealing with people?
3	... instructing, training or teaching people, individually or in groups?
4	... making speeches or presentations?
5	... persuading or influencing others?
6	... selling a product or service?
7	... counselling, advising or caring for customers or clients?
8	... working with a team of people?
9	... listening carefully to colleagues?
10	... physical strength (for example, to carry, push or pull heavy objects)?
11	... physical stamina (to work for long periods on physical activities)?
12	... skill or accuracy in using your hands or fingers?
13	... knowledge of how to use or operate tools, equipment or machinery?
14	... knowledge of particular products or services?
15	... specialist knowledge or understanding?
16	... knowledge of how your organisation works?
17	... spotting problems or faults?
18	... working out the cause of problems or faults?
19	... thinking of solutions to problems?
20	... analysing complex problems in depth?
21	... checking things to ensure that there are no errors?
22	... noticing when there is a mistake?
23	... planning your own activities?
24	... planning the activities of others?
25	... organising your own time?
26	... thinking ahead?
27	... reading written information such as forms, notices or signs?
28	... reading short documents such as short reports, letters or memos?
29	... reading long documents such as long reports, manuals, articles or books?
30	... writing material such as forms, notices or signs?
31	... writing short documents?
32	... writing long documents with correct spelling and grammar?
33	... adding, subtracting, multiplying or dividing numbers?
34	... calculations using decimals, percentages or fractions?
35	... calculations using more advanced mathematical or statistical procedures?

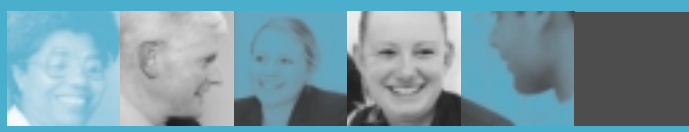
Source: *Dickerson and Green (2002).*

Table A5 Description of Generic Skills Taxonomy from the *Skills Surveys*

1.	literacy skills	both reading and writing forms, notices, memos, signs, letters, short and long documents etc.
2.	physical skills	the use of physical strength and/or stamina
3.	number skills	adding, subtracting, division, decimal point or fraction calculations etc., and/or more advanced maths or stats procedures
4.	technical know-how	knowing how to use tools, equipment or machinery, knowing about products and services, specialist knowledge and/or skill in using one's hands
5.	high-level communication	a range of related managerial skills: persuading or influencing others; making speeches or presentations; writing long reports; analysing complex problems in depth
6.	planning skills	planning activities, organising one's own time and thinking ahead
7.	client communication	dealing with people, selling a product or service, counselling or caring for customers or clients
8.	horizontal communication	teaching or training and/or working with a team of people, listening carefully to colleagues
9.	problem-solving	detecting, diagnosing, analysing and resolving problems
10.	checking skills	noticing and checking for errors

Source: *Dickerson and Green (2002).*

Glossary & References



Glossary

ABI	Annual Business Inquiry
AES	Annual Employment Survey
CBI	Confederation of British Industry
DfES	Department for Education and Skills
Employee based measures	weight establishment data by the total number of employees at the establishment
Establishment based measures	provide an estimate of the total number of establishments reporting a given skill deficiency
ESS	Employers Skill Survey
GNVQ	General National Vocational Qualification
Hard-to-fill-vacancies	(HtFVs) are those vacancies classified by the respondent as hard-to-fill
HESA	Higher Education Statistics Agency
IALS	International Adult Literacy Survey
IER	Warwick Institute for Employment Research
IES	Institute for Employment Studies (University of Sussex)
IoD	Institute of Directors
ISCED	International Standard Classification of Education
LFS	Labour Force Survey
Local LSC - local Learning and Skills Councils	refers to the areas covered by the 47 local arms of the national Learning and Skills Council
LSC	Learning and Skills Council
NSTF	National Skills Task Force
NVQ	National Vocational Qualification
OECD	Organisation for Economic Co-operation and Development
ONS	Office of National Statistics
Rates of return	a measure of the economic benefit of investing in skills
Recruitment problems	or difficulties refer to either hard-to-fill or skill-shortage vacancies
Skill deficiencies	refer to the sum of skill gaps and skill shortage vacancies

Skill gaps,	or internal skill gaps, is the extent to which employers perceive their employees' current skills as insufficient to meet current business objectives. Respondents in the ESS surveys were asked to comment on an occupation-by-occupation basis about the extent to which employees were 'fully proficient at their current job'. In order to gauge the extent of skill gaps survey respondents were asked: "What proportion of your existing staff at this establishment in [a particular occupation] would you regard as being fully proficient at their current job: all, nearly all, over half, some but under half, very few?"
Skill shortage vacancies	(SSVs) were defined as hard-to-fill vacancies which were skill related where at least one of the following causes was cited by the respondent: low number of applicants with the required skills, lack of work experience the company demands, or lack of qualifications the company demands
SOC	Standard Occupational Classification
SSC	Sector Skills Councils
SSDA	Sector Skills Development Agency
SVQ	Scottish Vocational Qualifications
TIMSS	Third International Maths and Science Study
Unweighted base	refers to the raw survey data
Weighting	is undertaken to adjust for sample design and non-response to ensure that the survey results are representative of the population of employers. Weighted data are also grossed up to population estimates in the weighted base provided by each table
Weighted base	refers to the base for percentages according to whether it has been weighted according to the employee or employer based measure

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