Skills In England 2001

The Research Report

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Professor Mike Campbell
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Executive Summary

This report provides a synthesis, review and assessment of the available evidence on the demand for, and supply of, skills in England. It also seeks to identify the main aspects of skill deficiencies and imbalances between skills demand and supply and to draw together the key findings from research as a basis for developing the skills agenda in the future.

The report should be useful as a resource for national, sectoral, regional and local agencies who require an insight into the state of skills in England; as a base for those involved in the planning of education and training provision; as a means of creating a stronger and more informed demand for skills acquisition by both employers and individuals; and as a framework and evidence base for Learning and Skills Councils.

Skills have a crucial role to play in enhancing economic performance and in stimulating social inclusion especially if the evolving pattern of skills acquired can effectively respond to the changing requirements of the labour market. These changes in the labour market have been, and look set to continue to, present major challenges for public agencies, employers and individuals.

Demand for Skills

- Changes in occupational structure, in qualifications and in skills required vary by economic sector and geography. The overall pattern is for the 'skill intensity' of employment to increase, especially in managerial, professional and associate professional occupations, with the qualifications held by people in jobs continuing to rise and with most jobs needing more training than previously.

- Growth is likely to be particularly concentrated in professional, associate professional and personal service occupations. However it is also necessary to replace the existing skills that will be lost to different occupations, through occupational mobility and retirements. The scale of this skills demand substantially exceeds that of the demand created by growth of 'new' jobs in the economy.

- The increasing need for job specific, technical skills is paralleled by an increased demand for skill types which cuts across sectors and occupations, including basic skills, generic skills (including verbal, numerical, planning and communication skills), IT skills and management skills

- There are very substantial regional variations in the pattern of recent, current and expected future skill needs and it will be necessary to address the particular evolving skill needs in each region to seek to ensure that the volume and structure of skills supply is appropriate to changing labour market requirements.

Supply of Skills

- In recent years there has been considerable progress in raising educational attainment. However, with regard to young people, attainment amongst boys at level 2 is relatively low, as it is amongst some ethnic minority groups. There is also limited progression amongst females from NVQ level 2 or equivalent to level 3.

- There are substantial variations in attainment levels across large sections of the workforce with, overall, more than 1 in 4 of the economically active still having no qualifications or qualifications below NVQ Level 2 or equivalent. Those most likely to be poorly qualified include the unemployed, economically inactive, older individuals, those employed in manual occupations and some ethnic minority groups. The latter's qualification levels are of particular concern, not only for reasons of social inclusion, but because they will account for a significant proportion of future workforce growth. Poor basic skills in literacy and numeracy are also an important issue effecting at least one in five of the workforce.

- There have been changes in the balance of academic and vocational qualifications, in the balance of subjects studies, the levels at which they have been studied and routes that people have taken in acquiring qualifications.

- Participation in post compulsory education and training amongst young people has increased considerably over recent years, though by international standards youth participation in full-time education remains low. Participation in adult learning is relatively constant over time and various significantly across different groups in the workforce with the lowest levels being amongst older workers, those in unskilled, semi skilled and skilled manual occupations and those who are already poorly qualified.

- Workplace training has increased in recent years, though again, access to it is unevenly distributed across the workforce with semi and unskilled manual and service workers, part-time workers and older workers being amongst those least likely to receive training. Moreover smaller establishments are less likely to provide (especially off the job) training and less likely provide training that leads to a qualification.

- Skill levels vary substantially across regions and localities with, for example, the proportion of those qualified to NVQ level 3 or above varying by up to 22% points among LSC areas. However, training levels appear to be higher in low skills regions.

Skills Imbalance

- Examining patterns of occupational wage differentials provides an insight into skill imbalances with large relative wage increases, all else being equal, indicating skills demand outstripping skills supply. The fastest increases have been overall amongst managerial, professional and associate professional occupations.

- Assessing the relative rates of return to different levels and types of qualifications shows high rates of return for level 2, 3 and 4 academic qualifications for both men and women. Returns to vocational qualifications at level 3 are comparable but below level 3 they are low except for those with limited prior ability. The highest rates of return accrue to professional qualifications. There is also evidence of high rates of return to the acquisition of literacy and numeracy skills.

- Consideration of the qualifications and previous occupations of the unemployed also provides an insight into those skills which are in excess supply. These appear to be concentrated amongst those with no or level 2 qualifications and those who previously worked in craft, plant/machine operative occupations and, to a lesser extent, in personal/protective service occupations. However the extent of the excess supply appears to be declining amongst craft workers.

- Skill shortage vacancies affect around 4% of employers with their nature and distribution exhibiting a higher degree of specificity in particular sectors and parts of the labour market. Skill shortage vacancies are strongly concentrated (40% of the total) in small establishments employing less than 5 people. They also particularly affect the manufacturing, construction, wholesale/retail, health/social care and, especially, the business services sectors of the economy. Three occupational groups – professional, associate professional and craft – account for over half of all skill shortage vacancies, with the most sought after skills being advanced IT skills and technical/practical skills other than IT.

- Skill gaps exist where there is a divergence between an organisation's current skill level and those which are actually required to meet the organisation's objectives. Skill gaps affect around 7% of establishments. They particularly affect manufacturing, and hospitality sectors.

- Skill shortage vacancies are predominantly concentrated in London, the South East, South West and East regions though the scale of variation across LSC areas is greater than across regions. There is a strong relationship between the geographic concentration of skill shortage vacancies in areas of low unemployment and rapid jobs growth.

- There are also large variations in the scale of skill gaps across localities, with the gaps being largest throughout most of the South and East of England.

- There is also evidence of the existence of latent skill gaps – gaps that are likely to emerge if the establishment were to improve its performance relative to its competitors. Such skill gaps constrain the potential for growth and may be equivalent to an increase in the scale of skill gaps by about 10% and skill shortages by 30%.

- In terms of international comparisons of workforce qualifications, the UK is around the OECD average in relation to the proportion of the workforce qualified to NVQ level 2, 3 and equivalent. However, it appears to be above average in relation to older workers and below average in relation to younger workers. The growth in the proportion of the workforce who have acquired NVQ 2 or equivalent level qualification is slower than in nearly all OECD countries and the growth in the proportion with degrees is slower than for the majority of OECD countries. However the UK now has the highest rate of university graduation amongst OECD countries.

- Participation rates in job related education and training are amongst the highest in the OECD, though the actual amount of time that each participant actually spends is relatively low

- International comparisons of literacy and numeracy levels show the UK at just below the OECD average, though we are especially weak with regard to the proportion of the adult population of working age who are proficient at only the lowest level (IALS level 1) of literacy and numeracy with more than 1 in 5 being at this level – the sixth worst in the OECD. On the other hand, in terms of the proportion proficient at the highest level (IALS level 5) the UK is ranked highly. Such results highlight a relatively high degree of polarisation of skill levels in the UK.

Chapter 1

Introduction

This chapter first sets out the purpose of the report and our overall approach. It then deals with some definitional issues before considering the economic contribution of skills to people's, companies, nations' well being. It concludes by outlining the structure of the report.

Purpose and Objectives

1.1 This report seeks to provide a synthesis, review and assessment of the evidence on the demand for, and supply of, skills in England. In so doing it seeks also to identify the main dimensions of skills deficiencies and imbalances between skills demand and supply. Finally, it aims to identify the key findings and messages as a basis for developing future priorities in the skills agenda.

1.2 The National Skills Task Force called for such an annual assessment of skills in its final report (NSTF 2000c). Moreover the research paper which supported the NSTF report (NSTF 2000a) was widely regarded as a comprehensive analysis of skill needs, but one which would need building upon in subsequent years by reviewing and assessing the evolving research literature on skills issues and updating the empirical evidence on the basis of official data, forecasts and survey evidence. In that sense, this report is the first of, what is to be hoped, a series of regular skills assessments.

1.3 It is hoped that this report will have a number of uses:

- As a resource for national, sectoral, regional and local agencies who require an insight into the state of skills in England. The report seeks to provide material at the regional and local, as well as national, levels where possible.
- As a resource for those involved in planning education and training provision
- As a foundation of creating a stronger and better informed demand for skills acquisition by individuals and employers
- As an evidence base for the development of the Department for Education and Skills policies
- As an evidence base for the development of the Learning and Skills Council's Corporate Plan
- As a framework which local Learning and Skills Councils could utilise in undertaking their own local skill needs assessments and against which they could benchmark local conditions

Approach

1.4 We have deliberately adopted an eclectic approach, drawing together a wide range of evidence from an extensive range of sources, in the belief that by utilising a variety of approaches and data sources we are more likely to be able to obtain a rounded assessment of skills issues than by focusing on a few major sources or on a single approach.

1.5 However, there are a number of essential sources of information on which we have drawn particularly heavily:

- The Employer Skills Survey 2001 undertaken by the Institute for Employment Research and IFF Ltd (for Chapter 5)
- Projections of Occupations and Qualifications 2000/2001 undertaken by the Institute for Employment Research (for Chapter 3)
- The Skills Survey of individuals undertaken by Francis Green and his colleagues (for Chapters 2 and 5).

1.6 Overall, we have sought to use 4 sets of proxies for skills: Occupations (the actual jobs that people do); Qualifications (the level of certified competence that people posess); individuals' assessment of their own skills; and employers' assessment of their skill requirements. The first two use official data sources (like the Labour Force Survey) whilst the last two use specifically commissioned surveys of individuals (like the Skills Survey or International Adult Literacy Survey) or employers (like the Employer Skills Survey).

Definitions

1.7 In assessing many aspects of skills in England we examine the evidence in terms of sectors, occupations and qualifications. In order to ease interpretation of this evidence we provide details of the sectoral, occupational and qualification classifications that we generally use. Moreover, in respect of sectors and occupations, we provide 'every day' examples of these to give meaning and substance to the sometimes opaque official classification categories.

1.8 **Sectors**: The current UK standard industrial classification (SIC) of establishments is SIC 92. It is based on the type of economic activity in which establishments are engaged, essentially defined by the nature of the products/services produced. It classifies economic activity into 17 sectors (sections) each of which is/can be subdivided further into divisions, groups, classes and sub classes. In this report we generally use simplified 6 fold or 12 fold classficiations, which group together the 17 sectors (see Annex 1 to this chapter).

1.9 **Occupations** SOC 2000 is the current UK standard occupational classification (SOC) of individuals based on the jobs/job tasks that they undertake and classified according to their skill level and content. It classifies occupations into 9 major groups and further into 25 'sub major' groups and 81 minor groups. We make use of each of the groupings in this report (see Annex 2 to this chapter). The previous standard occupational classification (SOC 90) is based on the same foundations as SOC 2000, which replaced it. It classified occupations into 9 major, 22 sub major and 77 minor groups and differs somewhat from the SOC 2000 classification. This classification is used on occasion in the report when other data sources have not yet been adjusted to the SOC 2000 classification and thus comparisons need to be made using SOC 90. This applies generally to earnings data.

1.10 **Qualifications**: Throughout this report we refer to qualification levels in terms of NVQ 'equivalents'. The main qualifications related to these levels, in addition to the National Vocational Qualifications themselves obtained at that level, are set out below:

NVQ Level	Qualification
5	Higher Degree
4	First Degree; Teaching Qualification; Nursing Qualification; HNC/HND; RSA Higher Diploma
3	2 or more Advanced Levels; RSA Advanced Diploma; ONC/OND; National BTEC; City and Guilds Advanced Craft; Trade Apprenticeship; Advanced GNVQ
2	5 or more GCSEs at Level A-C; 1 Advanced Level; GNVQ Intermediate; RSA Diploma; City and Guilds Craft; BTEC General
1	Less than 5 GCSEs; GNVQ

1.11 On other occassions, in particular, when considering the results from the International Adult Literacy Survey (IALS), levels 1-5 refer specifically to internationally comparable literacy levels (see chapter 5, para 113) rather than NVQ or equivalent levels. In addition, when making international comparisons we refer to upper secondary and tertiary levels of education. In the English case these broadly refer to NVQ2 or equivalent and degree level, respectively.

1.12 **Generic Skills**: The report also refers to a number of skill types, in particular to 'generic' skills. Generic skills are those that can be used across a range of different occupations and as such are 'transferable'. These encompass communication, problem solving, team working, IT, numeracy and reasoning skills (NSTF 2000a, Page 24). However, researchers may use a range of categorisations of skill types and these are reported where appropriate in the report. In particular, the work of Francis Green, Alan Felstead and colleagues (see, for example, Green et al 2000) distinguish between generic, specific, key and work skills.

1.13 **Geography**: Where possible, the data which is presented relates to England. Where this is not possible, data for the United Kingdom or Great Britain is provided. The relevant text or table makes clear which geographical area is being referred to. Regions are Government Office and Regional Development Agency regions and LSC boundaries are those of the 47 LSC areas. These are set out in an Annex (1.3) to this chapter.

1.14 **Demand and Supply**: Throughout this report we refer to the 'demand for skills' and the 'supply of skills'. The former refers to the skills required by **employers** as measured by the occupations, qualifications and other skills needed in the labour market. The latter refers to the skills available in the population that can be deployed to

meet these demands. Demand and supply thus refer to the situation in the labour market rather than in the learning market, where the demand for skills would refer to the skill that **individuals** were seeking to acquire, to subsequently deploy in the labour market.

1.15 **Data Sources**: All sources of data are identified in the text. However, it should be noted that this report is based on an extensive review of a wide range of research, reports and data. Different authors often utilize different data sets, collected in different ways, based on different definitions and relating to different time periods. This should be borne in mind in interpreting the evidence contained in this report, which is necessarily not always fully comparable or consistent.

The Value of Skills

1.16 This section of the chapter provides a brief overview of the evidence base on the economic benefits of skills acquisition. More extensive surveys of the evidence are to be found in Blundell, Dearden, Meghir and Sianesi (1999) and Campbell (2000).

Individuals

1.17 There is a strong relationship between qualifications and earnings (see figure 1.1). Overall, the more highly qualified people are the higher their earnings. For example, the average earnings of those who posses NVQ level 5 or equivalent qualifications is over £900 per month higher than those who have A Level or other NVQ3 equivalent qualifications ñ a premium of 70%. Similarly the earnings of those qualified to NVQ3 or equivalent exceed those of people without qualifications by around £600 per month - a premium of 85%. It is only at level NVQ3 and above that earnings exceed the average level of £315. However, earnings of those at level 2 are somewhat below those who have level 1 qualifications (Nacett 2001).

1.18 This positive link between earnings and attainment is common across most OECD countries (OECD 2001a, p299ff). If we examine the relationship between qualifications and earnings for prime age men and women (30-44 year olds) across the OECD countries (OECD 1998) we find that the premium for women in the UK of securing a degree compared to upper secondary level qualifications is 110% - the highest in the OECD. The premium for women of securing of upper secondary qualifications over no qualifications was 20%. For men, the premium in the UK of securing a degree relative to upper secondary qualifications is 65% - one of the 5 highest in the OECD. The premium for men of securing upper secondary qualifications over no qualifications was 25%.

Figure 1.1: Average earnings by highest qualifications held, England, 1999

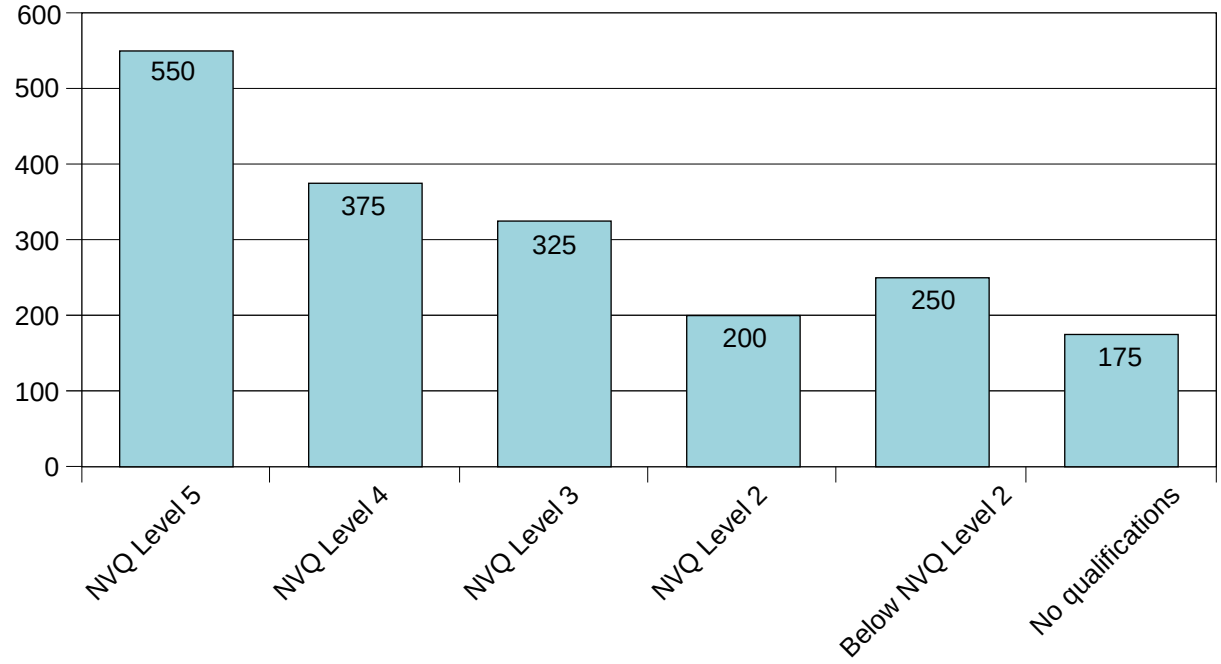
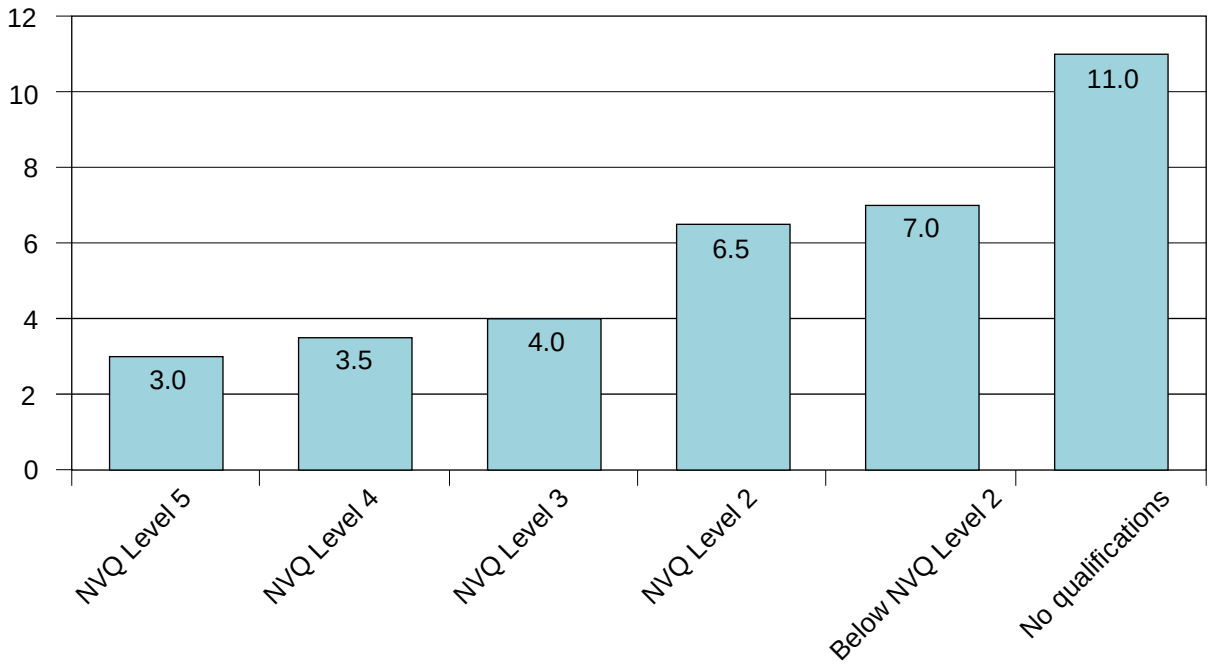


Figure 1.2: Unemployment rates by highest qualification held, England, 1999.



1.19 There is also a strong link between peoples' qualification levels and their likelihood of being unemployed (see figure 1.2). Unemployment rates vary systematically by qualification level as against the overall ILO unemployment rate of 5.7%, with the greatest improvement being associated with acquiring level 1 and level 3 qualifications (Nacett 2001).

1.20 A range of generic skills are also highly valued by the labour market (Green 1999). 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 13% compared to those who do not use computers.

1.21 Analysis of rates of return data across a range of countries shows that the 'returns

to schooling' (the number of years spent in full time education) in the UK are the second highest (around 8%) in the sample of 16 countries studied (Harmon and Walker 2001), though the rates of return are highest for those who earn most and are higher for women than men. Nevertheless, after extensive examination of various estimation methods, they conclude 'there is...an unambiguously positive effect on the earnings of an individual from participation in education'.

1.22 Dearden et al (2000, 2001) provide a comprehensive analysis of the returns to a range of UK qualifications as well as those to basic literacy and numeracy (see table 1.1). The key findings are that: the returns to academic qualifications are high at NVQ equivalent levels 2, 3 and 4; the returns to most professional qualifications are very high; and the returns to higher level vocational qualifications are also high. However, lower level vocational qualifications do not yield a significant return. When consideration is given to the time required to obtain the qualifications, the returns per year of study to vocational qualifications at levels 3 and 4 are in fact broadly similar to academic returns.

Table 1.1: Wage premium (%) from obtaining qualifications

Qualification	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
Level 1 / 2 NVQs	Nil	Nil
BTEC First	Nil	Nil
Level 3-5 NVQs	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

Notes: (1) The wage premiums 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
Results control for age, ethnicity, region, firm, size, public/private sector.

Source: Dearden et al. (2001)

1.23 Dearden et al (2000, 2001) have also shown that the returns to acquiring basic literacy and numeracy skills are also high in terms of both earnings and employment rates (see paras 5.10-5.18 in chapter 5). Bynner et al (2001) show that, after controlling for family circumstances and education achievement, (key skills) Level 1 and above numeracy and literacy skills produce respectively returns of 26% and 16% compared to adults with skills below these levels. The probability of employment is also considerably enhanced.

1.24 This work on rates of return corroborates the observation that the earnings of people with high levels of literacy/numeracy substantially exceed those with low levels (Moser 1999). Table 1.2 shows the substantial differences in earnings levels with, for

example, 49% of those with low levels of literacy and 55% of those with low levels of numeracy earn less than £9,000 per annum compared to 23% of those with high levels of literacy and 16% of those with high levels of numeracy.

Table 1.2 Earnings of People with Different Levels of Literacy and Numeracy

Source: Moser (1999) Table 3.1
Note 1 Low Level = IALS Level 1
2 High Level = IALS Level 4/

	Literacy		Numercy	
£ per year	**Low Level1**	**High Level2**	**Low Level1**	**High Level2**
<9,000	49	23	55	16
9,000 - 13,000	27	16	22	17
13,000 - 19,200	17	20	15	21
>19,200	7	40	7	48

1.25 There are also considerable earnings gains associated with training (for a review of the evidence see Machin and Vignoles 2001). One recent major international study (OECD 1999) demonstrated that the earnings gain for trained workers were particularly high in the UK - most especially for women and those educated to less than upper secondary level (opcit, P164). The UK evidence more generally shows a positive pay off to individuals similar to that for education especially for those with lower levels of education attainment (Blundell et al 1996), for women, and if the training is off the job (Blundell et al 1999).

Companies

1.26 A literature review of a range of studies on the effects of enterprise training on company performance commissioned by CEDEFOP concludes that: training has a positive effect on productivity; 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 (Barratt et al 1998).

1.27 There appears to be evidence of a strong connection between training and productivity with, an increase in the sector wide training rate of 50% being associated with a 4% rise in productivity. Moreover the productivity effect is around twice as high as the effect on workers wages, thus demonstrating the benefits of training to employers as well as individuals (Dearden, Reed and Van Reenan 2000). Other studies show a higher return on training when it is associated with a wider ‘bundle’ of human resources practices (Blundell et at 1999).

1.28 Cosh et al (2000) demonstrate a positive impact from training on jobs growth in small and medium size enterprises with, again, a wider bundling of human resource practices increasing the effect. Patterson et al (1997) in a study of 67 companies found that nearly a fifth of profitability differences between them were associated with differences in human resource practices in general, and skills development in particular.

The Economy

1.29 Long run studies tend to show a considerable contribution of education to economic growth in the UK. Psacharopoulos estimates a contribution of between 12% - 19% for the period 1945 - 1984, whilst Sturm (1993) estimates it to be around 19% for 1973-84.

1.30 Across the OECD, differences between countries in the 'stock' of human capital help significantly to explain observable differences in economic growth (OECD 2001a P48ff). Indeed, apart from trade exposure, it is probably the single most important explanatory variable. For the UK, it is the single most important variable.

1.31 Based on a sample of countries, a 1% point increase in school enrolment rates tends to generate economic growth of up to 3% points and an additional year of secondary level education for the population as a whole would have the impact of increasing economic growth by an additional 1% point per year (Sianesi and Van Reenan 2000). A study by Englander and Gurney (1994) showed that the enrolment rate in secondary education added 0.6% points to annual productivity growth between 1960-1985, across the OECD. In each decade of the 1960s, 1970s, and 1980s, they find that educational attainment is one of only 3 variables which have a robust correlation with productivity growth.

Communities

1.32 There is some limited evidence available on the economic benefits of learning for localities. This issue is of importance given the geographical focus of much policy and action on skills development.

1.33 A study for the NSTF (Campbell 1999) provided evidence not only of the substantial variations in skill levels across England but of the relation between these and a range of indicators of economic performance. Overall, the results show an association between various measures of local skills levels (the proportion of the workforce qualified to various levels) and employment growth, competitiveness (as measured by GDP per head), earnings and deprivation, providing extensive evidence of a link between skills, economic performance and social inclusion at the local level.

1.34 More widely, a recent study by the OECD (OECD 2001c) provides preliminary evidence of the links between skills acquisition and economic growth at the regional level, across the 15 EU member states. A correlation analysis between 3 measures of educational attainment (completion of primary, secondary and tertiary levels of attainment) and GDP per capita across the 180 EU regions shows 'a significant correlation between GDP per capita and the primary and secondary level indicators' though the relationship with tertiary level education is weaker. However the results for England show a strong relationship at this level.

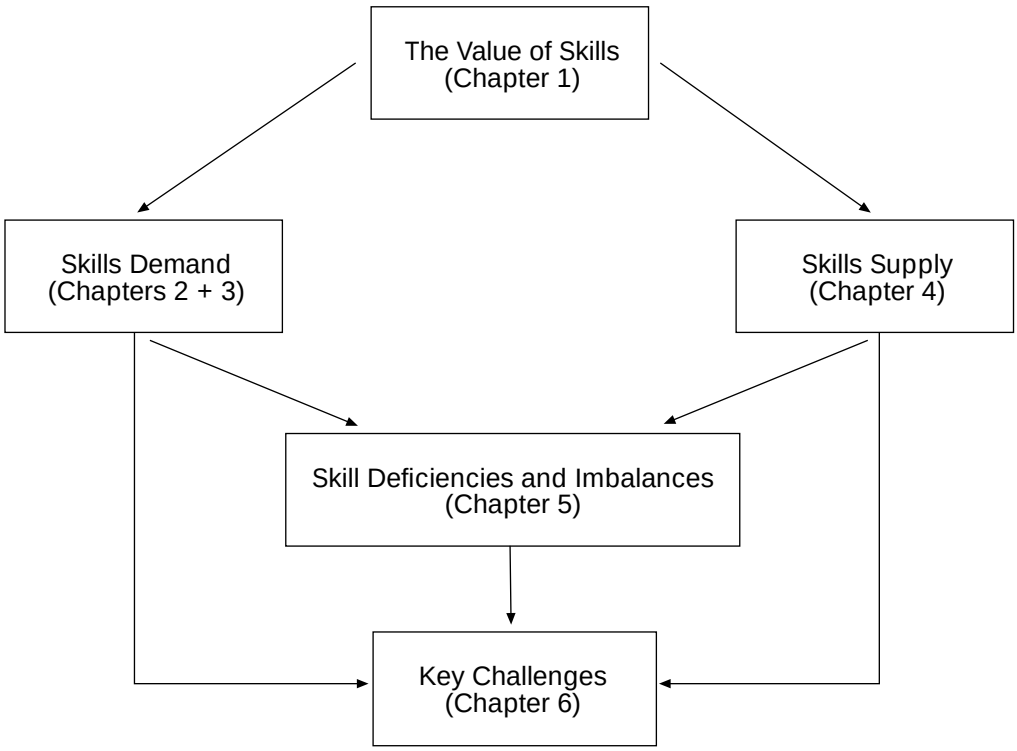
1.35 Skills are clearly highly valuable - to people, to companies and other organisations, to the country as a whole and to its constituent communities. Moreover Government policy places a high premium on skills as a key mechanism to enhance both competitiveness and social inclusion, so as to improve employment opportunities and living standards for all. This report, therefore, is designed to provide an evidence base on the Skills in England - what skills we've got, what skills we need and what are

main skill imbalances and deficiencies, in order to help inform the development of appropriate actions to raise skill levels - on both the demand and supply sides.

The Structure of the Report

1.36 The structure of the report is as follows (see figure 1.3). This chapter has briefly considered the importance of skills to individuals, to companies, to the country and to communities. This provides an insight into the value of skills; into the importance of undertaking this skills assessment, and into the importance of tackling the main skill challenges which we face. In chapters 2 and 3 we examine the demand for skills - the skills that we need, both now and in the future. Chapter 4 considers the supply of skills, the skills that we currently have available. Chapter 5 identifies the main skill imbalances and deficiencies. Each of these chapters concludes by drawing together the key points that have been identified. Chapter 6 draws together the key findings of the report by identifying the key challenges which could inform an agenda for action on skills issues.

Figure 1.3 Structure of the Report



Annex 1.1 SIC 1992 Classification of Sectors

CATEGORIES	SECTOR		EXAMPLES
Primary/Utilities	01, 02 ,03, 05	01 02 03 05	Agriculture, hunting and forestry Fishing Mining and quarrying of energy producing products, deep coal mines and open cast working, extraction of crude petroleum and natural gas, quarrying of stone, slate, gypsum, chalk, sand and clay Production and distribution of electricity, manufacture of gas and distribution of gaseous fuels through mains; collection, purification and distribution of water
Manufacturing	04	04	Food products, beverages and tobacco Textiles and textile products Leather and leather products; wood and wood products Pulp, paper and paper products; publishing, printing and reproduction of recorded media Coke, refined petroleum products and nuclear fuel Chemicals, chemical products and man-made fibres Rubber and plastic products Glass and glass products, ceramic products, cement, concrete and plaster Basic iron, steel, ferro-alloys, casting of iron and steel; manufacture of fabricated metal products such as central heating radiators and boilers, cutlery, locks and hinges Machinery for the use of mechanical power, machine tools, special purpose machinery, weapons, electrical and non electric domestic appliances Office machinery and computers, electrical machinery and apparatus not elsewhere classified, radio, television and communication equipment, medical, precision and optical instruments, watches and clocks Motor vehicles, parts and accessories, ships, locomotives, aircraft, motorcycles, trailers, bicycles, and other transport equipment Furniture, jewellery, musical instruments, sports goods, games, toys and other manufacturing not elsewhere classified; recycling of metal and non metal waste and scrap
Construction	06	06	Building of complete constructions or parts thereof, civil engineering Installation of electrical wiring and fittings, plumbing, insulation, plastering, painting, glazing, joinery, floor or wall covering Renting of construction or demolition equipment with operator

CATEGORIES	SECTOR		EXAMPLES
Distribution, transport etc	07, 08, 09	07	Sale, maintenance, repair of motor vehicles/motorcycles, retail sale of automotive fuel
			Wholesale trade and agents
			Retail trade, repair of personal and household goods
		08	Hotels, motels, restaurants, bars, licensed clubs, public houses, canteens, take-aways and catering
		09	Road, rail, air, sea, coastal and inland water transport
			Storage, warehousing, cargo handling and supporting transport activities
			Travel agencies and tour agencies
Business & miscellaneous services	10, 11, 15, 16	10	Financial and monetary intermediation: banks, building societies, credit granting, investment trusts and mortgage finance companies
			Insurance and pension funding
		11	Activities auxiliary to financial intermediation: security, broking and fund management
			Real estate activities, renting of machinery and equipment without operator,
			Computer supply, consultancy and database activities, repair and maintenance of computing machinery
			Research and experimental development on social sciences, humanities, natural sciences and engineering
			Legal, accounting and auditing activities, tax, business and management consultancies
		15	Sewage and refuse disposal, sanitation and similar activities
			Business, employers and professional organisations
			Recreational, cultural and sporting activities
			Washing and dry cleaning, hairdressing, beauty treatment and funeral activities
		16	Private households with employed persons such as maids, cooks, gardeners and caretakers
Non market services	12,13,14,17	12	Public administration including the activities of agencies that provide health care, education and cultural services
			Defence, judicial, public security, law and order and fire service activities
			Compulsory social security activities
		13	Education: primary, secondary, further and higher education, private training providers
		14	Health and social work including hospital, nursing home, medical, dental practice and vetinary activities
			Social and charitable work activities
		17	Extra-territorial organisations such as the United Nations, European Commission, IMF and the World Bank
			Activities of diplomatic and consular missions when being counted by the country of their location rather than being counted by the country they represent

Annex 1.2 SOC 2000 Classification of Occupational Categories - 25 Sub-major Groups

	Sub-major groups	Occupation (examples)	Occupation minor group number
11	Corporate managers and senior officials	Directors and chief executives of major organisations, senior officials in national/local government;	
		production, works, construction and maintenance managers	111,112
		Financial, sales, purchasing, personnel, training and research managers	113
		Quality assurance and customer care managers; financial institution and office managers	114,115
		Transport, warehouse, retail and wholesale managers	116
		Officers in the armed forces, police officers (inspectors and above), senior officers in fire, ambulance, prison and related services	117
		Hospital and health service managers, social service, residential and day care managers	118
12	Managers/proprietors in agriculture and service industries	Farming, conservation, forestry and fishing managers	121
		Hotel, restaurant, catering, leisure, sports and travel agency managers and proprietors	122
		Shopkeepers and retail/wholesale dealers, hairdressing, beauty salon, property, garage managers and proprietors	123
21	Science and technology professionals	Chemists, biological scientists, physicists, geologists and meteorologists	211
		Civil, mechanical, electrical, electronics and production engineers, design and development engineers	212
		IT strategy, planning and software professionals	213
22	Health professionals	Medical practitioners, psychologists, ophthalmic opticians, pharmacists, dental practitioners and veterinarians	221
23	Teaching and research professionals	Higher and further education lecturers, primary and secondary school teachers, special needs education teachers, school inspectors and education officers	231
		Scientific and social science researchers	232
24	Business and public service professionals	Solicitors, lawyers, judges and coroners	241
		Chartered accountants, management consultants; architects, town planners, quantity and chartered surveyors	242,243
		Social workers, probation officers, clergy; librarians, archivists and curators	244,245
31	Science and technology associate	Laboratory, quality assurance and engineering technicians	311
		Draughtspersons, building inspectors and town planning technicians	312

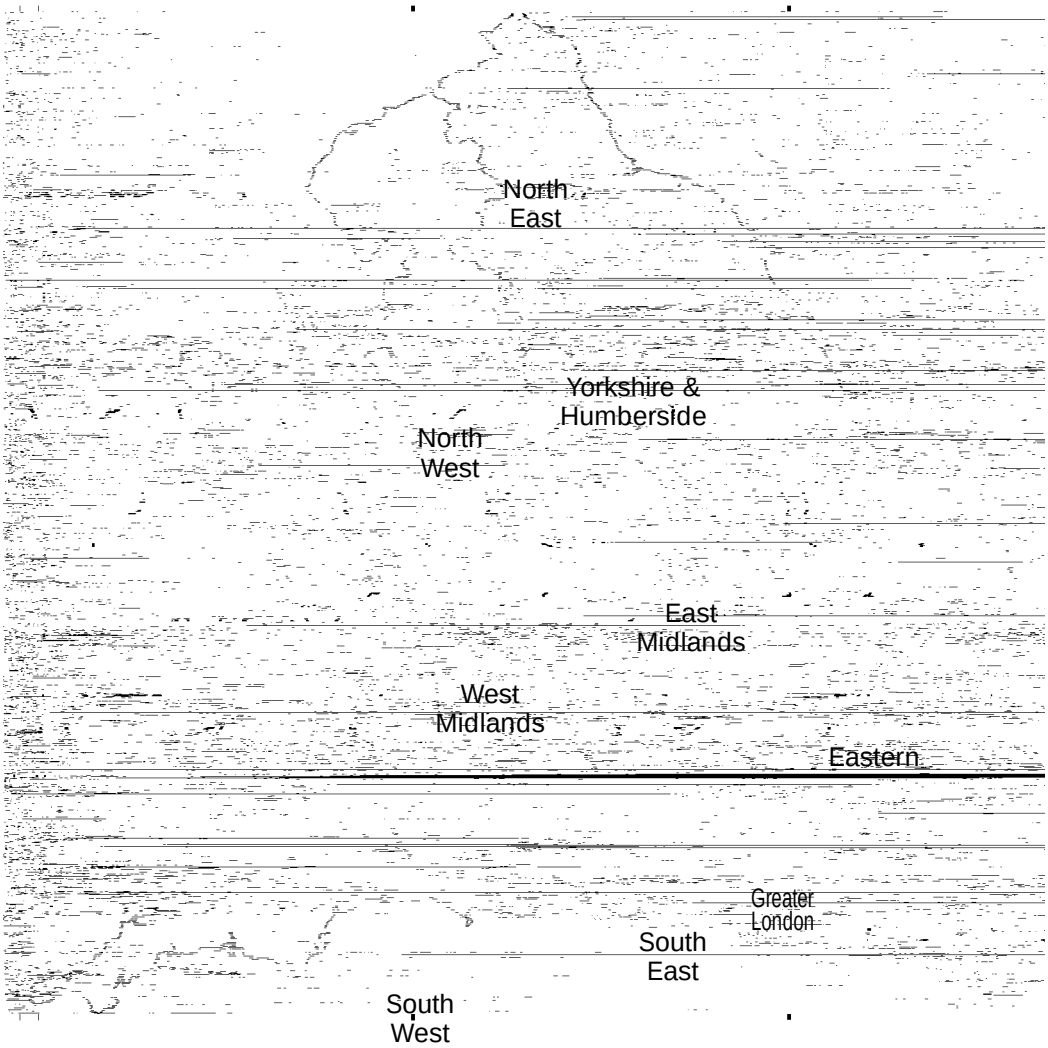
32	Health and social welfare associate professionals	Nurses, midwives, paramedics, dispensing opticians, dental technicians; physiotherapists, occupational and speech therapists Youth and community workers, housing and welfare officers	321,322 323
33	Protective service occupations	Police officers (sergeant and below), fire service officers (leading fire officer and below), prison officers (below principal officer), NCOs and other ranks	331
34	Culture, media and sports occupations	Artists, authors, writers, actors, musicians, producers and directors; graphic, product and clothing designers Journalists, newspaper editors, public relations officers and photographers; sports players, coaches and fitness instructors	341,342 343,344
35	Business and public service associate professionals	Air traffic controllers, aircraft pilots, train drivers; barristers clerks, conveyancers, legal assistants and legal executives Estimators, valuers, brokers, insurance underwriters, taxation experts, importers and exporters; marketing professionals and estate agents Environmental protection officers and park rangers; personnel and industrial relations officers, vocational and industrial trainers, careers advisors, health and safety officers	351,352, 353,354 355,356
41	Administrative and clerical occupations	Civil service executive/administrative officers, local government clerical officers and assistants; credit controllers, accounts, wages and counter clerks Filing, insurance, pensions, stock, transport and database clerks Telephonists, communication officers; general office clerks and assistants	411, 412 413 414, 415
42	Secretarial and related occupations	Secretaries, receptionists and typists	421
51	Skilled agricultural trades	Farmers, horticulturists, gardeners, gamekeepers, fishermen, tree surgeons and stable managers	511
52	Skilled metal and electrical trades	Sheet metal workers, welders and pipe fitters; metal machining setters, tool makers and maintenance fitters Motor mechanics, auto electricians and vehicle spray painters; telecommunications, electrical, TV, audio and electronic engineers	521, 522 523, 524
53	Skilled construction and building trades	Steel erectors, bricklayers, plumbers, joiners, glaziers and window fabricators Plasterers, floorers, wall tilers, painters and decorators	531 532

54	Other skilled trades	Weavers, knitters, upholsterers, tailors and dressmakers; printers, print finishers, bookbinders and screen printers Butchers, bakers, chefs and cooks; glass, furniture and pattern makers, goldsmiths, silversmiths and florists	541, 542 543, 549
61	Caring personal service occupations	Nursing auxiliaries, dental nurses, residential wardens, care assistants and home carers Nursery nurses, playgroup assistants and educational assistants; grooms, veterinary nurses and assistants	611 612, 613
62	Leisure and other personal service occupations	Sports and leisure assistants, travel agents, tour guides, air and rail travel assistants; hairdressers, barbers and beauticians Housekeepers, caretakers; undertakers and pest control officers	621, 622 623, 629
71	Sales occupations	Sales and retail assistants, retail cashiers and check-out operators, telephone salespersons Credit agents, debt and rent collectors, van salespersons, market and street traders	711 712
72	Customer service occupations	Call centre operators, sales order clerks, telephone advisors and customer services assistants	721
81	Process plant and machine operatives	Food, drink, glass, plastics, textile and chemical process operatives; paper, wood, and metal machine working operatives Assemblers, routine inspectors and testers, weighers, sorters, tyre fitters and sewing machinists; scaffolders, riggers, road and rail construction operatives	811, 812 813, 814
82	Transport and mobile machine drivers and operatives	Van, bus, coach, HGV and taxi drivers, chauffeurs, driving instructors, rail and air transport operatives Crane, fork lift truck, mobile machine and agricultural machinery drivers	821 822
91	Elementary occupations: trades, plant and machine related	Farm, forestry and agricultural workers; labourers in building, woodworking and other construction trades Industrial cleaners, packers, bottlers, canners and fillers; dockers, slingers, warehousemen and store keepers	911, 912 913, 914
92	Elementary occupations: clerical and services related	Postal workers, mail sorters and couriers; hospital and hotel porters, waiters, waitresses, bar staff and leisure attendants Cleaners, launderers, pressers and refuse collectors Security guards, traffic wardens, school patrol and car park attendants, school mid-day assistants; shelf stackers and bill posters	921, 922 923 924, 925

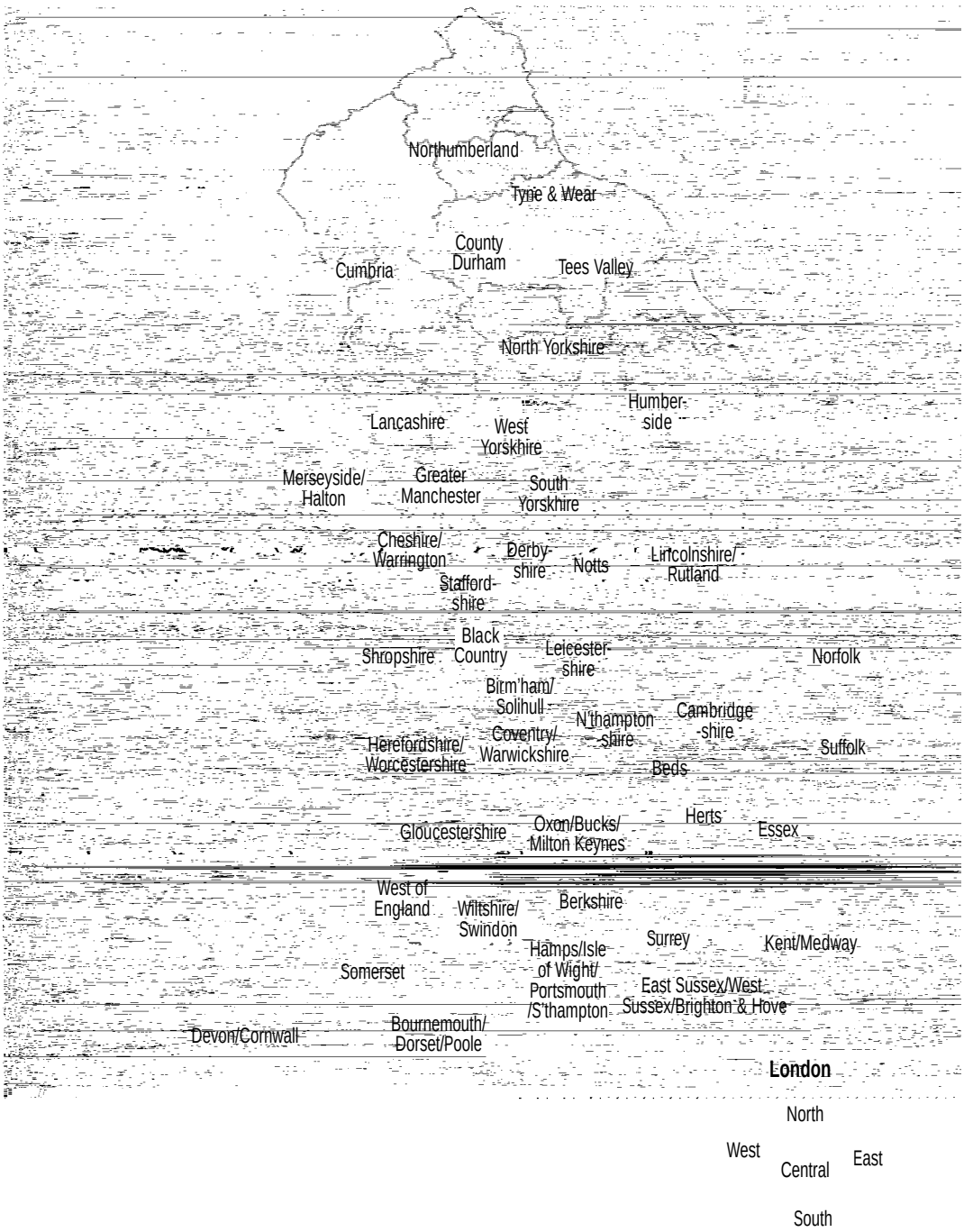
Notes: (a) Standard Occupational Classification. SOC Revision Team, 10th edition, August 1999.

Annex 1.3 English Regions and Learning and Skills Council Areas

Government Office Regions



Learning and Skill Council Areas

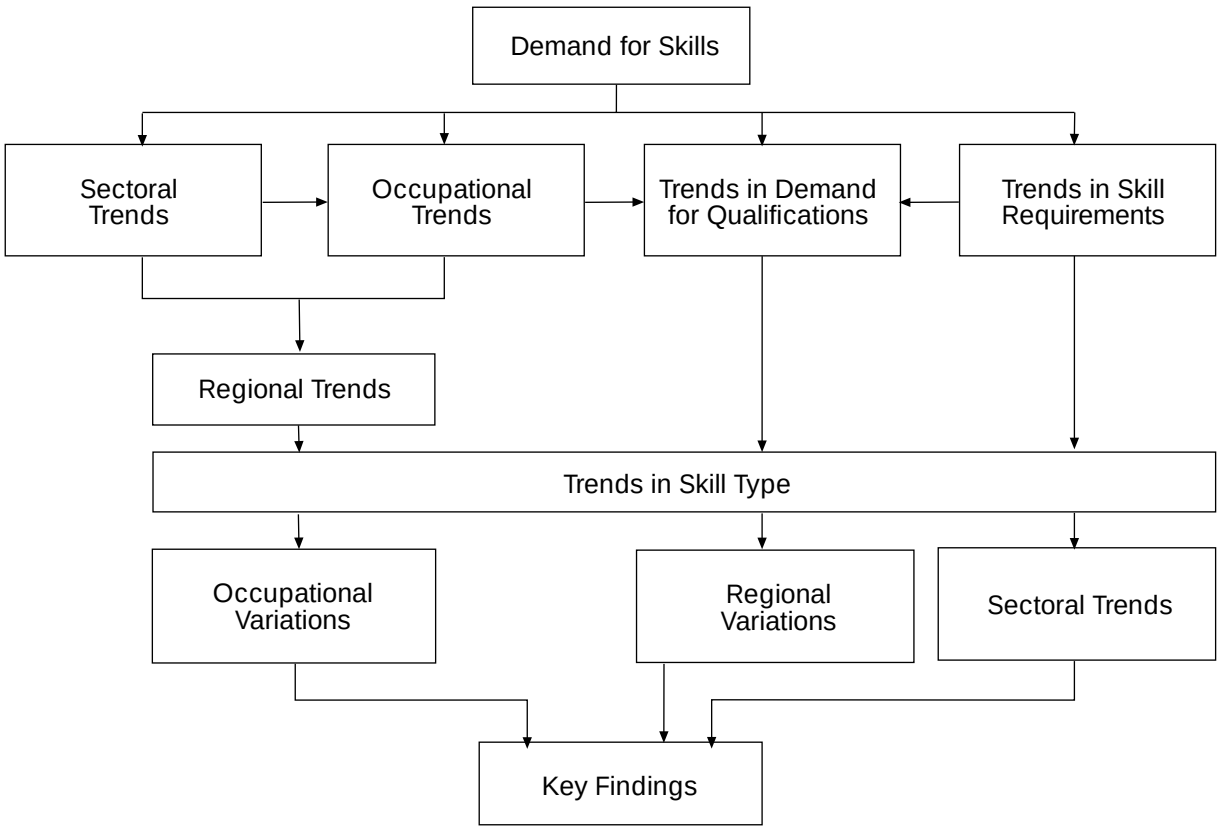


Chapter 2

The Demand for Skills

This chapter reviews the most recently available evidence relating to the demand for skills by employers. It begins with an analysis of the changing sectoral and occupational structure of employment and how these vary across the regions. It then goes on to examine changes in qualifications before considering trends in four key types of skill – basic, intermediate, IT and management. The chapter then reviews the findings of recent research into the 'attributes' required for specific jobs and the generic skills actually utilised on the job across occupations, sectors and regions. We conclude with a summary of recent findings from the 'skills dialogues' that have considered trends in, and factors influencing skills demand across a range of sectors.

The structure of the chapter is illustrated in the orientation chart below:



Overall trends in employment

2.1 Over the 1990s there was an increase of 1.55 million in the total number of people employed in the United Kingdom. Part of this growth reflects the recovery from a recessionary period and also partly reflects the 'long boom' of economic growth over the period 1993 to date. Levels of employment are currently at a historical high, with unemployment levels lower than at any time since 1973. This overall growth in employment suggests an increasing trend in the demand for skills by employers. It is important to break down this overall increase in skills demand in order to understand what types of skills are in particular demand, and the skills for which demand is declining.

2.2 There are a number of ways in which the demand for skills by employers can be measured and understood, none of which alone paint a complete picture. In particular,

the structure of employment in terms of sector, occupations and regions that is described by the official employment statistics is actually the outcome of the **interaction between** supply and demand factors. It is important, therefore, to take a broad view of the evidence from statistics, surveys and case studies in order to arrive at a clear picture of trends in the demand for skills and the factors that are driving the changes that have been observed. It is the aim of this chapter to present such a broad view, examining changes in employment from a range of different perspectives that, together, influence the overall demand for skills by employers. These include:

- Changes in the main economic sectors in which people are employed
- Employment trends by occupational group, and its interaction with sectoral change
- Trends in the location of the employment of people in different sectors and occupations
- The formal qualifications held by people in employment, across sectors and occupations
- The types and levels of skills (e.g. basic, intermediate, information technology (IT), managerial) that are utilised in different jobs
- Trends in skill requirements as measured by survey evidence and case studies
- Sectoral evidence from the process of skill dialogues – the process by which skills information has been brought together to provide a coherent assessment of skill needs in individual industries. To date around 5 of the 16 planned have so far been completed.

Sectoral Trends

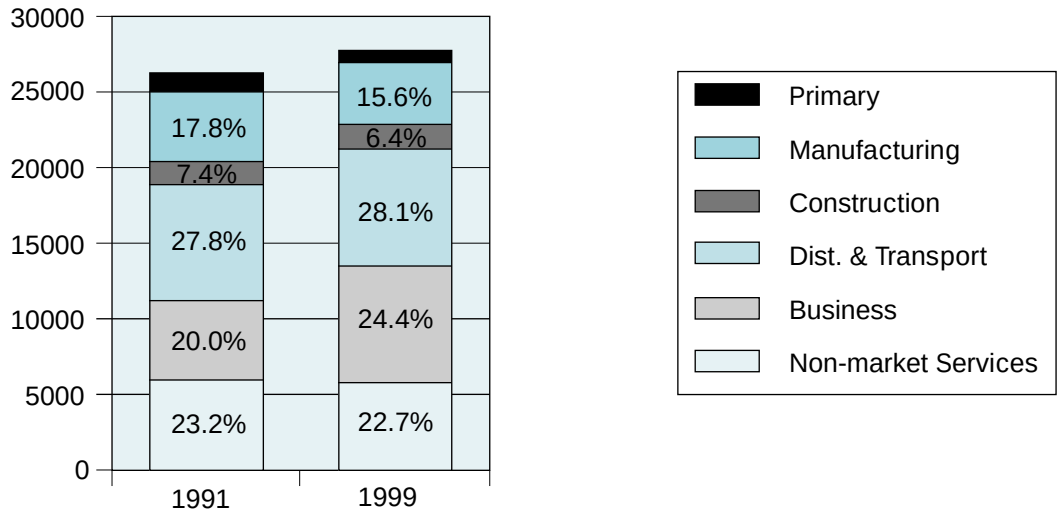
2.3 Over the last decade, the sectoral pattern of jobs growth has been very uneven. The business services sector has seen the biggest increase in employment; with the creation of over one and a half million new jobs since 1991: a 29 per cent increase (see Figure 2.1). The other growth sectors have been distribution and transport (by 491,000) and non-market services (232,000).

2.4 The manufacturing sector has seen the biggest fall in employment – by 331,000 between 1991 and 1999. The primary sector has also seen a substantial decrease, reducing the number it employs by a quarter, or some 241,000 jobs. Over the past 20 years the manufacturing sector has reduced the number of individuals it employs by 1.7 million, but, as Figure 2.2 suggests, the rate of decrease is slowing. Of the 1.7 million jobs, 1.4 million were lost during 1981 to 1991, while only 300,000 were lost between 1991 and 1999.

2.5 Table 2.1 shows that both the primary and manufacturing sectors have seen decreases in all regions, while the business, distribution and miscellaneous services

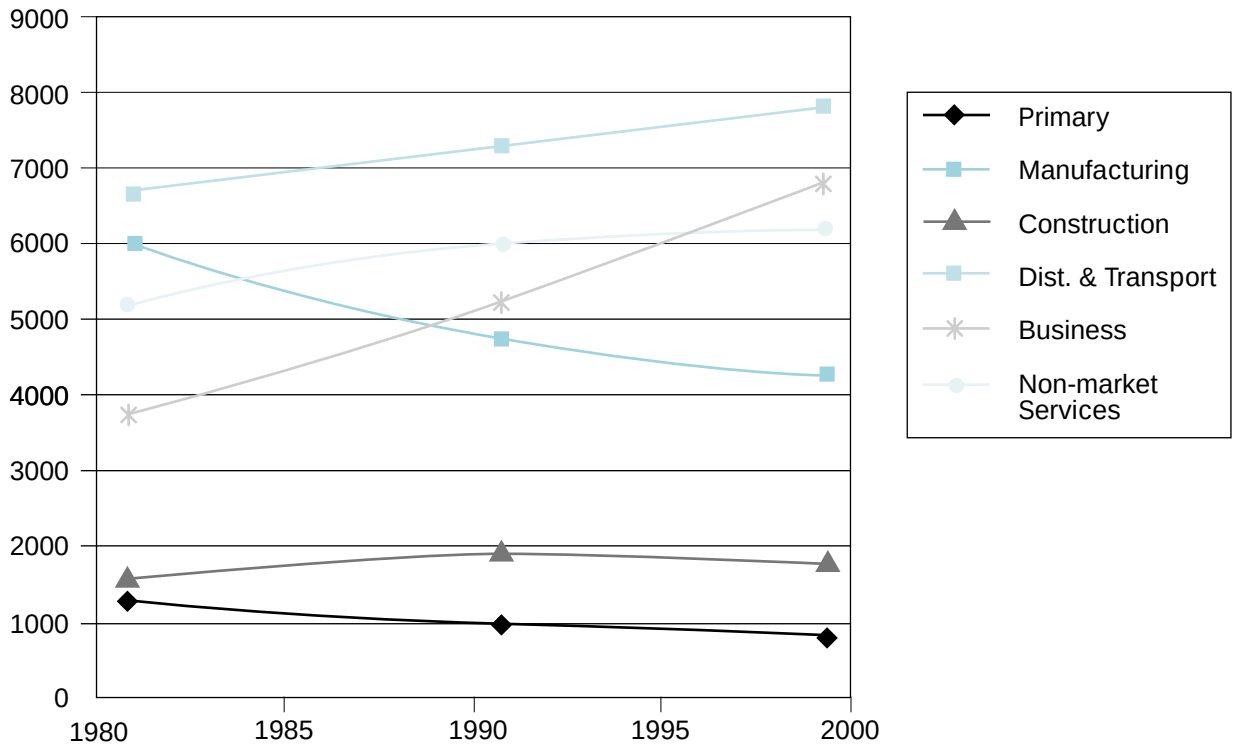
sectors have seen increases in all regions. Manufacturing declined most in the North West, West Midlands and London whilst the reductions were rather modest in the South East, South West and East Midlands. The decline in construction was most marked in London. The decline in employment in the primary sector was greatest in Yorkshire and the Humber, East Midlands and the South West.

Figure 2.1: Sectoral Structure of UK Employment 1991 & 1999 (numbers employed, in '000, and %)



Source: Wilson (2001a) Page 15, Table 3.2

Figure 2.2: Employment Trends by sector 1981 - 1999 (in '000)



Source: Wilson (2001a) Table 3.2, Page 15.

2.6 The experience of the most rapidly growing sectors also varied considerably across the regions. Business and miscellaneous services grew most in London and the South East – indeed between them they accounted for nearly 50% of total jobs growth in the sector. On the other hand growth was very modest indeed in the North East. The distribution sector grew most rapidly in London and, to a lesser extent, in the East and South East. Employment in non-market services (e.g. education, health and public administration) grew in all regions, to a differential extent, with the exception of London.

Table 2.1: Change in Employment by Sector and Region, 91-99 (000s)

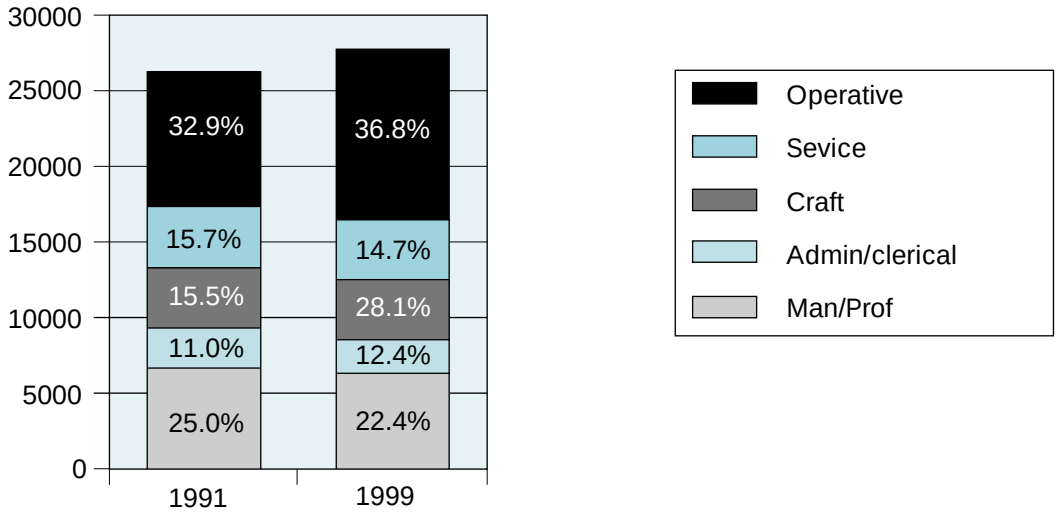
	Primary Sector and Utilities	Manufacturing	Construction	Distribution, Transport etc	Business and Misc. Services	Non-market Services
London	-20	-60	-46	132	399	-52
South East	-11	-10	-10	73	326	35
East	-16	-36	10	70	155	12
South West	-31	-6	-18	41	91	51
West Midlands	-18	-58	-18	49	117	34
East Midlands	-37	-3	-8	41	92	19
Yorkshire & Humberside	-39	-22	-10	13	98	36
North West	-24	-73	-28	29	98	12
North East	-8	-13	-13	7	20	8

Source: Wilson (2001b)

Occupational change

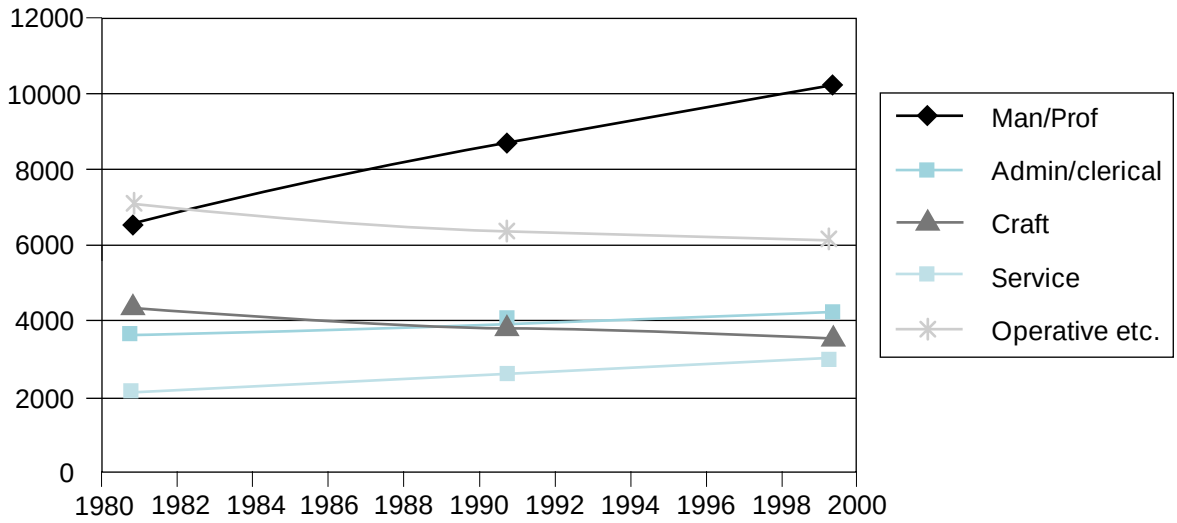
2.7 Figure 2.3 shows change in the broad structure of employment by occupation between 1991 and 1999 using the SOC 2000 classification. The most significant change over the past eight years has been the increase in the number of people employed in managerial, professional and service occupations. The proportion of people employed in managerial and professional occupations has increased from 33% to nearly 37%, an increase of almost 1.6 million people. On the other hand, the proportion of jobs accounted for by operatives fell from 25% to less than 22.5%, representing a decline of over 300,000 jobs. The longer-term continuing shift in employment from blue-collar (manual, craft and operative) jobs to white-collar (non-manual) jobs is demonstrated clearly in Figure 2.3.

Figure 2.3: Occupational structure of UK employment, UK 1991 & 1999 (numbers employed, in 'ooo, and %)



Source: Wilson (2001a) Table 4.1, Page 32.

Fig 2.4: Change in employment by board occupational group, UK 1981 - 1999



Source: Wilson (2001a) Table 4.1, Page 32.

2.8 A more detailed examination of recent employment change based on the 25 SOC sub major occupational groups (Figure 2.5) reveals in which specific occupations the changes have occurred. Identification of the main jobs associated with these occupational groups appears as Annex 1 to chapter 1 and should aid the interpretation of these trends and make their examination more concrete. The key findings at this level are:

- Of the one and a half million net new jobs in managerial, professional and associate professional occupations, over 420,000 have been for corporate managers (i.e. those working in managerial positions in public sector and medium and large sized private sector organisations).

- However, managers and proprietors (including small business owners and managers including shopkeepers) have seen a decline of around 50,000 between 1991 and 1999.

- Business and public service associate professionals have also seen a significant increase with 284,000 extra jobs.

- There are now 211,000 more science and technology professionals (e.g. engineers and scientists) than there were in 1991.

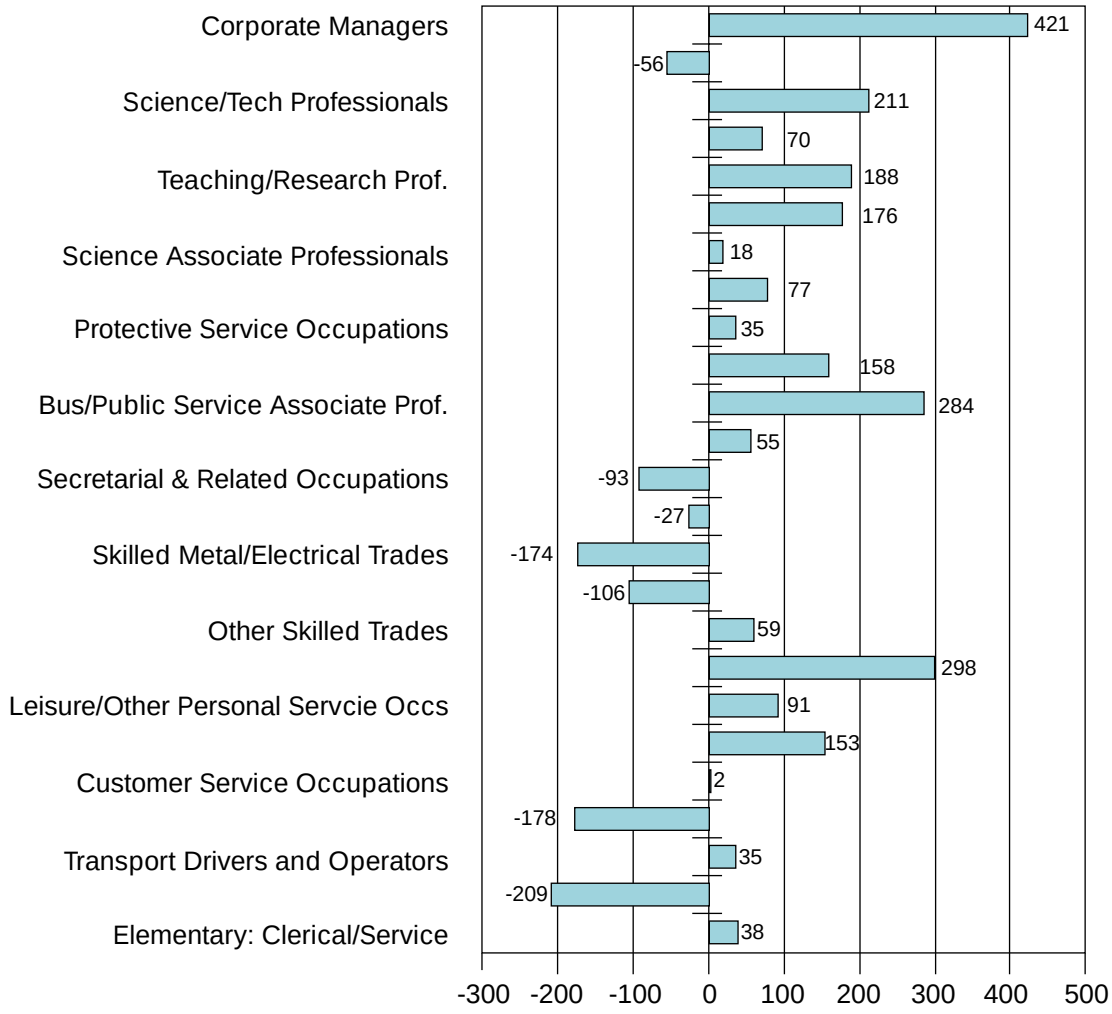
- Caring personal service occupations, such as people that assist in childcare, healthcare and animal care, have experienced an addition of nearly 300,000 new jobs, a 41 per cent increase between 1991 and 1999.

- Numbers employed in sales occupations have increased substantially with the creation of an additional 153,000 new jobs.

2.9 The most striking decline in jobs over the past eight years has been in manual occupations. In 1991 56 per cent of all jobs were to be found in SOC categories 5-6 (skilled trades and protective services) and 8-9 (plant and machine operators, drivers and elementary occupations) covering mainly manual occupations (both skilled and unskilled). By 1999 the proportion of employment accounted for by these jobs had fallen to 51 per cent. This represents a net decline of over 600,000 jobs within these occupations with 248,000 being in skilled trade occupations.

2.10 It is important to recognise however, that employment in these occupations 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 3).
Source: Wilson (2001a) Table 4.3, Page 37.

Figure 2.5: Employment change by occupation 1991 - 1999 (UK) (Thousands)



Source Wilson (2001a) Table 4.3, Page 37.

2.11 More detailed analysis reveals where these losses have occurred:

- Trades, plant and machine related jobs within elementary occupations have seen the greatest reductions with 209,000 fewer individuals employed.
- The number of process, plant and machine operators has also declined substantially. Since 1991 there are 178,000 fewer individuals within these occupations.
- Within skilled occupations it is the skilled metal / electrical trades and skilled construction trades that have seen the greatest decline.
- Other skilled trades, which include occupations in textiles, printing and food, is the only skilled trade occupation that has seen an increase between 1991 and 1999.
- Losses have also been registered in secretarial and related occupations, where 93,000 jobs have been lost over the last decade.

Regional patterns of occupational change

2.12 Overall employment growth across the regions has been uneven. For example from 1995-9 jobs growth varied from 2.7% per annum in the South East and 2.6% per annum in London, to 0.4% in Yorkshire and the Humber and no growth at all in the North East. Recent vacancy trends show a similar picture – with variations in the proportion of establishments reporting vacancies in the 1999 Employers' Skills Survey varying from 47.6% in Berkshire and 42% in Sussex to just 22% in Cumbria and 21% in Northumberland.

2.13 Table 2.2 shows the main changes in employment between 1991 and 1999 by occupation across the regions. To an extent, these changes reflect the regional variations in sectoral employment trends illustrated in Table 2.1. However, it is important to understand the regional dimension of occupational change, in order to identify differences in the pattern of skills demand that might be explained by variations in the nature of local or regional labour markets. For ease of interpretation, the shaded cells in Table 2.2 represent those occupations for which total employment has declined between 1991 and 1999 in particular regions.

2.14 Whilst the numbers of people employed as managers, and professionals are increasing across all regions, they are doing so particularly rapidly in London and the South East, which together account for almost 50% of the overall increase in these occupations. On the other hand the increase in the North East is very modest.

2.15 The growth in associate professional and technical occupations is, again, concentrated in the South East and London with only modest growth in the North East. The growth in personal service occupations is more evenly distributed across the regions as is that for sales and customer service occupations. 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.

2.16 Skilled trades experienced a decline across all regions, except in the South East, whilst process, plant and machine operatives and elementary occupations experienced their biggest losses in the North West and London. Their losses were most modest in the East and South East. Also, the number of jobs within both skilled and unskilled manual occupations have fallen across all regions since 1991, the only exception being within elementary occupations in the South East, which has seen an increase of 10,000 jobs over the past eight years.

Table 2.2: Employment Change by Occupation and Region, 91-99 (000s)

	London	South East	East	South West	West Midlands	East Midlands	Y & H	North West	North East
Managers and senior officials	**99**	**90**	**46**	**23**	**19**	**28**	**20**	**8**	**5**
Professional occupations	**153**	**111**	**52**	**57**	**45**	**32**	**41**	**55**	**11**
Ass Prof and Tech occupations	**170**	**104**	**50**	**41**	**42**	**30**	**28**	**36**	**9**
Admin and secretarial occupations	**-52**	**7**	**-2**	**-12**	**13**	**10**	**13**	**-13**	**-7**
Skilled trades occupations	**-32**	**4**	**-1**	**-20**	**-28**	**-24**	**-25**	**-51**	**-18**
Personal service occupations	**44**	**59**	**37**	**39**	**40**	**31**	**28**	**40**	**14**
Sales and customer service occupations	**26**	**19**	**16**	**21**	**14**	**12**	**7**	**16**	**7**
Process, plant and machine operatives	**-39**	**-2**	**-4**	**-2**	**-18**	**-8**	**-10**	**-32**	**-8**
Elementary occupations	**-13**	**10**	**0**	**-17**	**-25**	**-6**	**-27**	**-45**	**-15**

Source: Wilson (2001a) Table 2, Page 29, 39, 49, 59, 69, 78, 89, 99, 109.

Changes in occupational structure within sectors

2.17 While the changes in occupational structure described above can be explained partly by the major sectoral shifts that have taken place, there have also been substantial shifts in occupational structure within sectors. Table 2.3 illustrates the change in occupational structure of the four largest sectors (in terms of employment) in the economy. For ease of interpretation the shaded calls refer to those occupations for which the proportion of employment in the sector has declined. Since 1991 all sectors, except distribution and transport, have seen an increase in the proportion of those employed in managerial, professional (and associate professional) occupations with the business services and manufacturing sectors experiencing the most notable increases (see Figure 2.6).

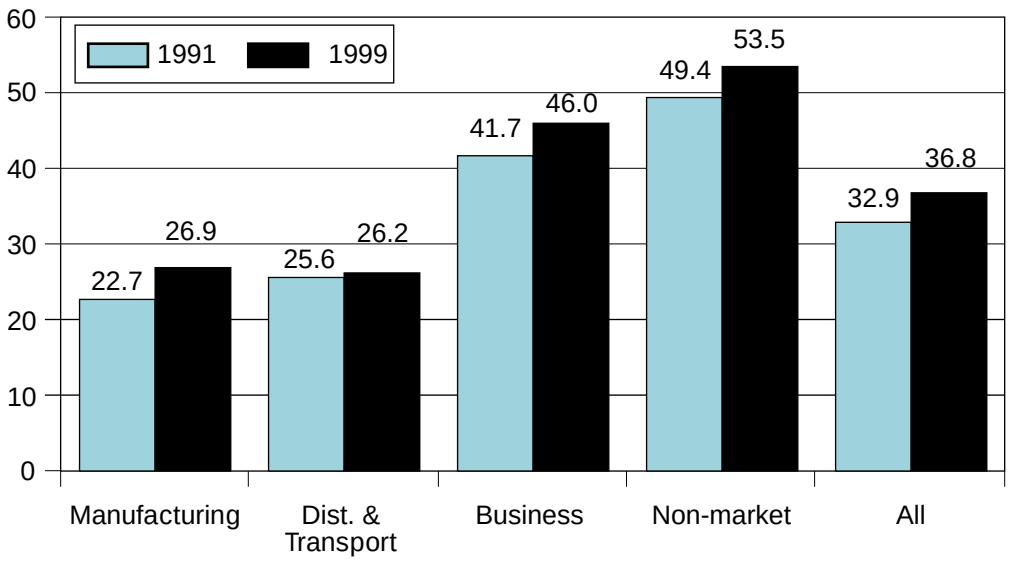
2.18 The decline in the proportion of craft and process workers employed has been most marked in manufacturing whilst the decline in administrative and secretarial employment has occurred largely in business services and, to a lesser extent, in non-market services.

Table 2.3: Occupational structure – selected industries, 1991-1999, UK (% employment in the sectors)

	Manufacturing		Dist. & transport		Business		Non-market		All	
	1991	1999	1991	1999	1991	1999	1991	1999	1991	1999
Managers	9.9	11.7	17.6	16.9	15.4	15.4	7.7	8.0	12.6	13.2
Prof occs	5.2	6.3	2.2	2.6	11.2	13.5	21.5	24.7	9.3	11.1
Assoc prof	7.6	8.9	5.8	6.7	15.0	17.0	20.2	20.7	11.0	12.5
Admin	9.6	9.0	11.4	10.7	29.4	25.5	17.4	15.5	15.7	14.7
Craft	26.2	24.4	14.1	14.0	5.4	5.0	2.9	2.4	15.5	13.7
Personal	1.1	1.3	2.5	3.0	5.3	6.7	11.0	13.2	4.6	5.8
Sales	1.9	2.0	18.1	18.7	3.2	2.9	1.1	1.0	6.4	6.6
Process	24.0	22.2	10.3	10.0	4.5	4.1	3.1	2.5	10.0	8.9
Elementary	14.6	14.1	17.9	17.4	10.6	9.8	15.1	11.8	15.0	13.5

Source: Skillsbase.dfes.gov.uk

Figure 2.6: Proportion of managers, professional & associate professionals - selected industries, UK



Source: Skillsbase.dfes.gov.uk

Qualifications of the employed workforce

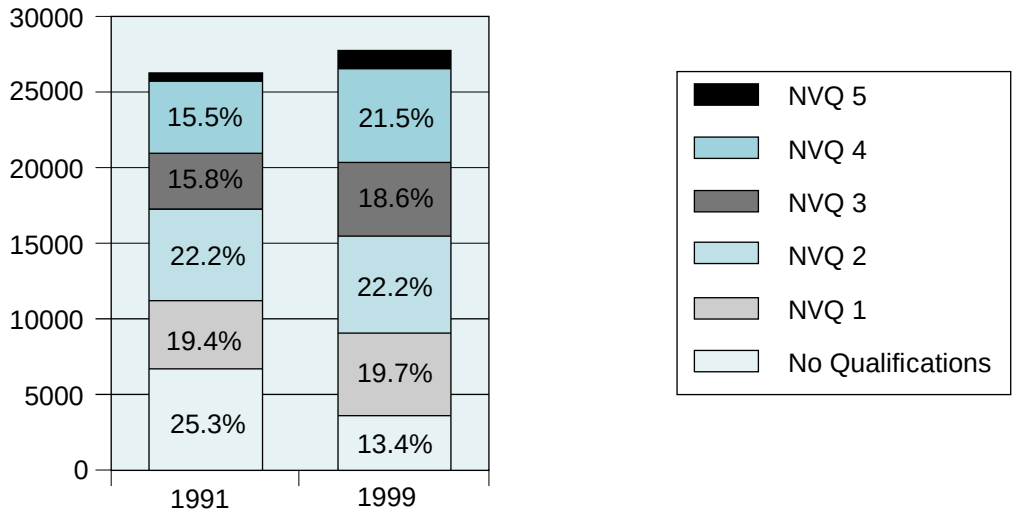
2.19 While the above review of the changing sectoral, occupational and regional pattern of employment provides some useful insights into the changing demand for skills, it is only a partial picture. In particular, the relationship between specific sectors and occupations and the types of skills and qualifications required in order to perform a

job effectively, is changing constantly for a range of reasons including the introduction of new technologies, changes in work organisation, regulatory requirements or changes in customer demand. The factors that are driving changes in the demand for qualifications and skills are considered in the final section of this chapter, while this section examines the available evidence regarding recent trends in the qualifications held by the employed workforce.

2.20 The proportion of those in employment with some sort of qualification rose from 75 per cent in 1991 to 87 per cent in 1999, while the percentage that holds qualifications equivalent to NVQ4/5 or equivalent rose from 17 to 26% (see Figure 2.7). The proportion qualified to level 3 has also increased, whilst the proportions qualified to levels 1 or 2 have remained broadly similar. The proportion that holds no qualifications has declined dramatically: indeed nearly halved – from 25% to 13%.

2.21 Data from the first quarter of the Labour Force Survey for 2001 appear to indicate further increases in the number and proportions of those qualified to NVQ levels 3, 4 and 5 or equivalent, and further declines in the numbers and proportions holding NVQ1, or equivalent, qualifications and those with no formal qualifications.

Figure 2.7: Qualifications level of individuals in employment, UK (in '000 and %)



Source: Wilson (2001a) Table 5.1, Page 51.

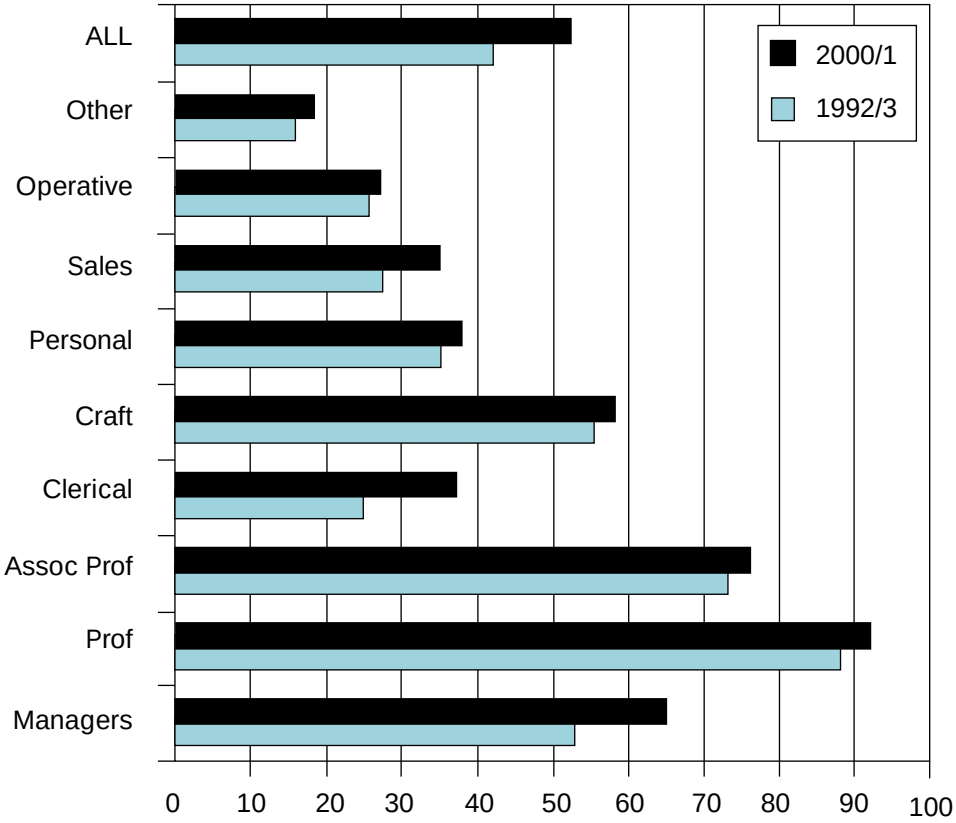
2.22 All occupational groups are becoming more qualified as measured, for example, by the proportion of employees qualified to NVQ3 or equivalent and above (see table 2.4 and Figures 2.8a and b). The increase is greatest amongst managers and clerical/secretarial occupations with a large increase also among those employed in sales occupations.

Table 2.4: Qualification level[1] by occupation, England (thousands and percentages)

Occupation	NVQ 5		NVQ 4		NVQ 3		NVQ 2		NVQ 1		No Qualifications	
	1992/3	00/01	1992/3	00/01	1992/3	00/01	1992/3	00/01	1992/3	00/01	1992/3	00/01
Managers /administrators	99	254	794	1194	896	1027	675	790	459	377	500	271
%	2.9	6.5	23.2	30.5	26.2	26.2	19.7	20.2	13.4	9.6	14.6	6.9
Professional occupations	324	645	1382	1533	203	228	98	108	113	101	46	15
%	14.9	24.5	63.8	58.3	9.4	8.7	4.5	4.1	5.2	3.8	2.1	0.6
Associate Prof. & tech	66	159	914	1292	428	522	244	364	198	181	85	45
%	3.4	6.2	47.2	50.4	22.1	20.4	12.6	14.2	10.2	7.1	4.4	1.8
Clerical, secretarial	18	37	278	476	577	795	1264	1335	668	528	518	294
%	0.5	1.1	8.4	13.7	17.4	23.0	38.0	38.5	20.1	15.2	15.6	8.5
Craft and related	*	11	144	182	1429	1355	280	422	339	338	654	359
%		0.4	5.1	6.8	50.1	50.8	9.8	15.8	11.9	12.7	22.9	13.5
Personal, protective	*	18	161	259	575	703	46	752	347	478	576	322
%		0.7	7.6	10.2	27.2	27.8	21.6	29.7	16.4	18.9	27.2	12.7
Sales occupations	*	19	127	211	328	455	487	717	280	294	471	284
%		1.0	7.5	10.7	19.3	23.0	28.7	36.2	16.5	14.8	27.7	14.3
Plant / machine operatives	*	*	55	79	458	454	243	400	477	595	755	448
%			2.8	4.0	23.0	22.9	12.2	20.2	24.0	30.0	37.9	22.6
Other occupations	*	*	43	60	263	267	289	421	302	396	897	570
%			2.4	3.5	14.7	15.5	16.1	24.5	16.8	23.0	49.9	33.2
ALL OCCUPATIONS	522	1155	3898	5284	5158	5805	4037	5308	3183	3287	4502	2609
%	0.2	4.9	18.3	22.5	24.2	24.8	19.0	22.6	14.9	14.0	21.1	11.1

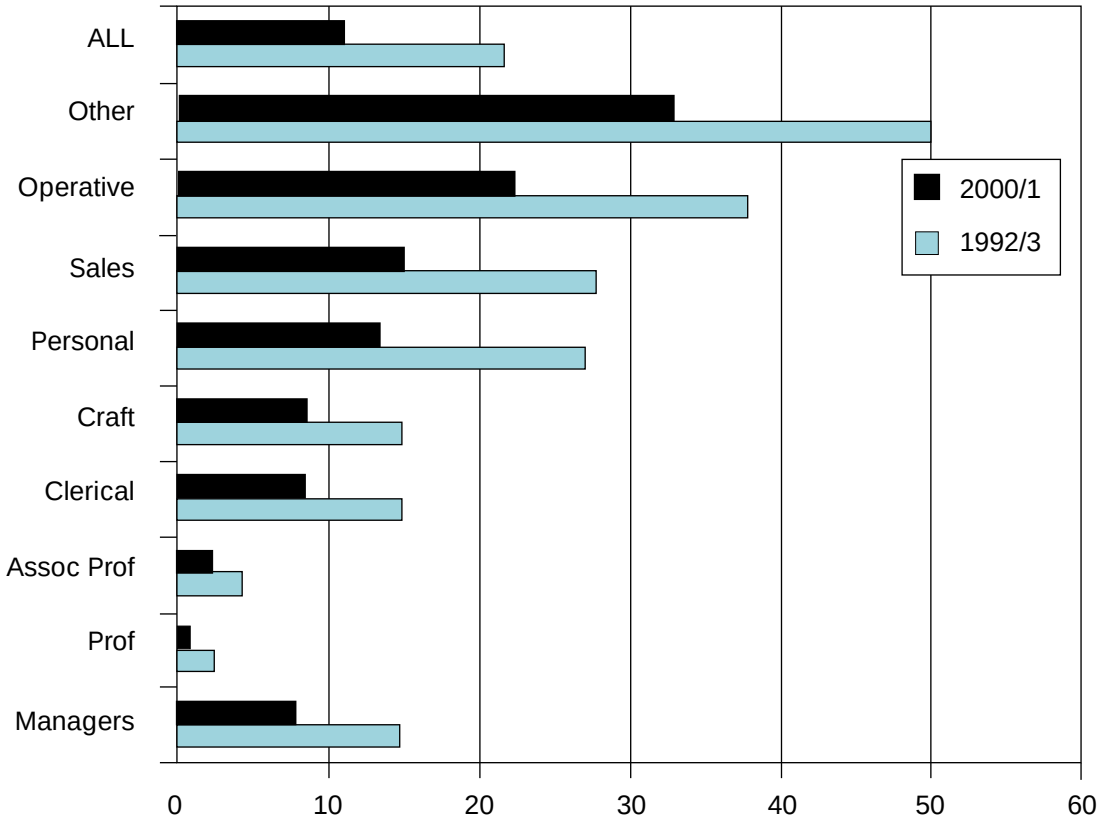
Source: Labour Force Survey, Winter 1993 and 2001
Note 1: NVQ level, or equivalent, qualification
2: Less than 10,000 in cell, estimate not shown

Figure 2.8a Percentage of employees qualified to NVQ3 and above, by occupation, UK, 1992/3 and 2000/1



Source: National Statistics, Labour Force Survey, Dec-Feb 93 & Dec-Feb 01

Figure 2.8b Percentage of employees with no qualifications, by occupation, UK, 1992/3 and 2000/1



Source: National Statistics, Labour force Survey, Dec-Feb 93 & Dec-Feb 01

2.23 Increases are especially great, in proportionate terms, at NVQ level 5 or equivalent amongst managers, in professional occupations and amongst associate professional and technical occupations. Indeed, in professional occupations there has been an increase of over 320,000 people qualified at this level between 1992-2000. At NVQ level 4 or equivalent, the biggest percentage increases have been amongst managers and in clerical and secretarial occupations, with increases in the absolute numbers of people qualified to this level of over 325,000 and nearly 200,000 respectively.

2.24 The situation at NVQ level 3 or equivalent is quite different. Whilst increases in the proportions, and numbers, of people qualified to this level have been recorded amongst sales occupations and in clerical/secretarial occupations, there have been no real increases elsewhere and, indeed, some small reductions in NVQ 3 or equivalent level qualifications.

2.25 Other points of note include the large increases in the proportion, and numbers, of people qualified to NVQ2 or equivalent in craft and related occupations (from 10% to 16% and by 140,000 respectively); in personal and protective occupations (from 22% to 30% and by nearly 300,000 respectively); in sales occupations (from 29% to 36% and by 230,000 respectively); amongst plant and machine operatives (from 12% to 20% and by over 150,000 respectively); and in other occupations (from 16% to 25% and 130,000 respectively).

2.26 Figure 2.8b also illustrates the considerable reductions in those employed who have no qualifications, across the occupational groups.

2.27 The evidence presented here so far – regarding occupational trends and changes in the qualifications held by people in employment – suggests that skill levels have risen and changed quite substantially over the last decade. However, the statistical review of occupational and qualification trends paints only a partial picture of skill trends that requires verification from other sources.

2.28 For example, the analysis so far has not considered the changing nature of occupations themselves. Whilst the actual occupational titles and classification systems remain stable, the actual **content** of particular jobs may have changed – it may have become more or less ‘skilled’ (Green et al 2000). The tracking of ‘within occupation’ changes in skills is crucial to our understanding of trends in the demand for skills.

2.29 Moreover, increasing educational attainment and an increase in the actual stock of qualifications held by the employed workforce does not necessarily imply that these are **necessary or appropriate** for the actual jobs that people do (Mannocada and Robinson 1997). It is to these issues that we now turn.

Trends in Skill Requirements.

Survey evidence

Survey Evidence

2.30 The Learning and Training at Work Survey (in 2000) reports that 61% of employers believe that the skills needed in their average employee were increasing, a figure very similar to that in the 1999 Survey (62%)

2.31 A range of related studies has recently shed considerable light on the skills actually used by the workforce (Green et al 2000; Green 1999; Ashton et al (1999); Felstead et al 1999). A major survey (henceforth 'the skills survey') was conducted in 1997 containing data on 2,467 people aged 20-60 who were in employment in 1997 and which uses two sets of job based skills measures. Some of the results from this survey can be compared with other survey results from 1986 and 1992, where they used similar questions (Gallie 1991, Green et al 2000).

2.32 First, there is a set of **attributes** designed to measure the abilities and capacities required for the job. There are 3 measures used (a) qualifications – what qualifications people possessed, what qualifications they would now require to get the same job and how necessary these qualifications are for doing the job competently (b) training time – how long a period of training was necessary to undertake the type of work they were doing and (c) learning time – how long would it take to do the job well. Skill trends over time can be examined comparing the situation in 1997 with that in 1986 and 1992, in which some of the same questions were used. (Gallie 1991).

2.33 Second, respondents are asked to state their use of particular skills – henceforth 'generic skills' – problem solving, communication skills, team working and computing skills – both now (in 1997) and 5 years ago. Changes in these types of skills can thus be examined over the period 1992-7. We deal with each of the sets of findings on skill trends in turn.

2.34 Firstly, in relation to the **attributes** required for jobs, the 1997 Skills Survey found that between 1986 and 1997 the proportion of jobs that required some form of qualification had risen from 62 per cent to 69 per cent. For high level (above 'A' level) qualifications the proportion rose from 20% to 24%. The proportion requiring no qualifications fell from 38.5% to 31.5%. There was, however, a slight dip in the proportion of jobs requiring qualifications at level 3. On this measure, overall skill requirements have clearly risen.

2.35 One way of measuring skills actually utilised in a job is the level of qualifications that is **both** required of new recruits **and** which is also regarded as necessary to do the job. On this measure too there has been an increase in skills required – again at all qualification levels….except at level 3. It is important to note that these skill increases are, however, more pronounced for women than men.

2.36 With regard to the training and learning time measures, the main results are set out in table 2.5. There has been a decrease in the proportion of workers whose type of work requires only short (less than 3 months) training. There has also been an increase in the proportion of jobs with long (more than 2 years) training requirements. There has also been a fall in the proportion of jobs which respondents judge take only a short time (less than one month) to 'learn to do well'.

Table 2.5 Training and Learning Times Required

Qualifications Required	All (%)		Men (%)		Women (%)	
	1986	1997	1986	1997	1986	1997
Length of Training < 3 months	66	57	58	54	76	61
> 2 years	22	29	30	34	12	23
Time taken to learn to do jobs well						
< 1 month	27	21	18	16	38	28
> 2 years	24	24	34	31	12	17

Source: Green et al (2000) Table 4.4. Page 88

2.37 It is noticeable that women's skill levels have, on these measures, been catching up with those of men – though they still remain at a lower level. Moreover the upskilling is not particularly concentrated amongst younger members of the employed workforce, as might be expected due to the considerable rise in the qualifications level of young people joining the workforce over the period. Skills, on a wide range of measures (required qualifications, prior training and time to learn job) have increased as much, if not more, amongst those age 35 and over (Green et al; 88-89).

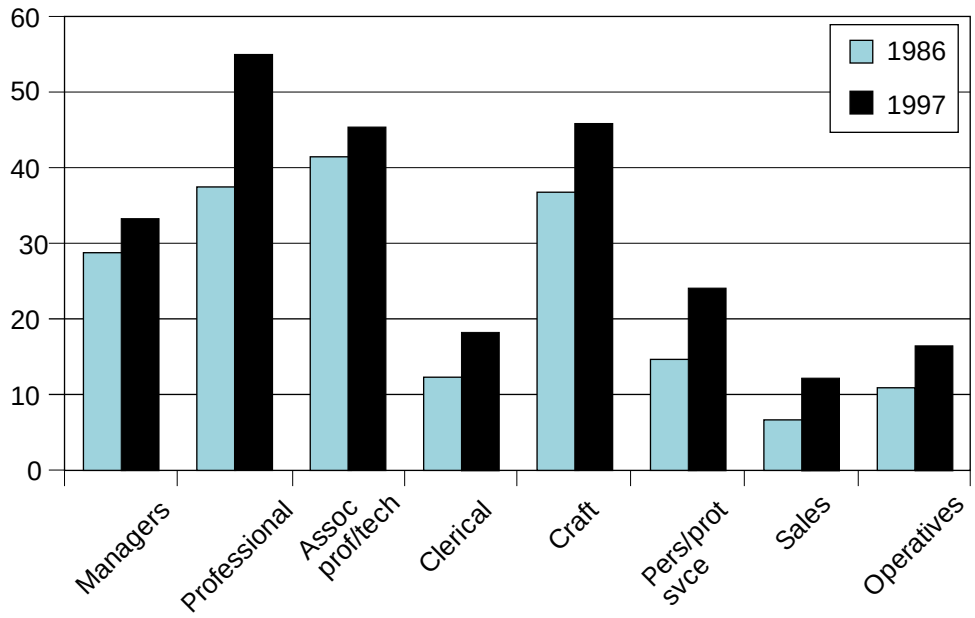
2.38 Turning to the trends in skills required **within** occupational groups, Table 2.6 sets out the results for all 6 skill measures used. For every occupational group there is overall an increase in skills, though not on every measure, in every occupation. The highest rates of skill increase, with statistically significant increases across five of the six skill measures, were in 'Personal and Protective Services' occupations. Training and learning times increased in all occupations.

2.39 The measure on which, perhaps, the increase in skills required is most marked, is the proportion of respondents indicating that their job requires a high level of prior training. The results across the different occupations, for 1986 and 1997, are set out in Figure 2.9.

2.40 However, when we examine trends across different sectors of the economy, there are two sectors of the eleven that were analysed which did not witness an overall increase in skill levels – wholesale and retail, and health.

2.41 We now turn to generic skills. The abilities demanded by different jobs vary enormously and to capture this diversity, the 1997 Skills Survey included questions on a broad range of different job activities, and respondents were asked how important each job activity was in their current job. In order to address the question of how job demands had changed over recent years, respondents were asked a number of repeat questions about the job they held five years before the date of the survey. The questions focussed on skills related to problem solving, communication and social skills, manual skills and computing. By comparing the average importance ratings given for activities carried out in jobs occupied in 1992 with the average ratings for the same activities five years later, it is possible to track trends in these particular skills.

Figure 2.9: Proportion of jobs requiring 'high' level of prior training



Source: Green et al (1999) Table 4.7, Page 91.

Table 2.6 Skill trends by occupation

Occupation	Requiring any qualifications	Using degrees %	With low prior training %	With high prior training %	With short time to learn job %	With long to learn job %
Managers & administrators				**	*	
1986	78.8	13.0	55.9	28.8	14.5	32.1
1997	78.5	17.0	51.8	32.4	5.8	39.5
Professional			**	**		
1986	97.2	45.4	46.5	36.7	6.7	49.8
1997	98.2	49.9	32.2	54.1	5.7	51.5
Associate professionals & technicians		**	*		**	
1986	86.3	11.9	41.3	41.0	13.0	39.7
1997	89.6	20.4	34.4	43.9	5.7	36.7
Clerical & secretarial		**	**	**		
1986	78.4	1.2	72.0	11.4	21.1	10.1
1997	81.4	3.0	65.2	17.1	19.6	9.4
Craft & related			**	**	**	
1986	68.1	1.5	54.1	36.2	15.2	39.7
1997	72.3	1.9	42.1	45.3	7.3	41.1
Personal & protective service	**	*	**	**	**	
1986	33.2	0.0	77.0	14.0	48.1	16.4
1997	59.1	0.9	55.5	23.4	30.3	14.1
Sales occupations			**	*		*
1986	31.7	1.8	89.0	6.3	49.0	7.6
1997	37.6	1.4	81.7	11.9	44.5	3.5
Plant & machine operatives				*		
1986	41.9	0.4	80.7	10.1	36.1	16.8
1997	43.1	0.0	77.8	15.5	38.3	13.3
Other occupations						**
1986	16.1	0.9	92.8	4.2	63.4	2.0
1997	20.3	0.0	89.4	7.2	58.9	6.0

Notes: Significant levels for difference between 1986 and 1997: *=10%, **=5%
Source: Green et al (1999) Table 4.7 Page 91.

2.42 Table 2.7 summarises the main results. For all problem solving skills, all communication and social skills and all computing skills, the proportions of respondents reporting a higher level in 1997 than they reported for their jobs 5 years earlier, exceeded those reporting lower levels, by a substantial margin. Counting each move up/down the skill ‘scale’ as one, column 3 presents the average ‘change’ in position, which is also positive for all these skills.

Table 2.7: Type of work skill changes in Britain 1992 to 1997

Skill type	Increasing[a] %	Decreasing[a] %	Average change[b] %
Problem-Solving Skills			
Spotting problems or faults	34.6	20.4	0.25
Working out the causes of problems or faults	36.7	20.2	0.29
Thinking of solutions to problems or faults	34.1	19.9	0.25
Analysing complex problems in depth	39.3	18.6	0.37
Communication and Social Skills			
Dealing with people	34.7	12.6	0.34
Instructing, training or teaching people	46.7	17.3	0.62
Making speeches or presentations	31.9	12.4	0.27
Persuading or influencing others	36.4	21.8	0.25
Selling a product or service	29.4	20.1	0.20
Counselling, advising or caring for customers or clients	36.9	24.6	0.45
Working with a team of people	34.9	27.8	0.27
Manual Skills			
Physical strength	20.7	27.3	-0.12
Physical stamina	20.2	31.0	-0.20
Skill or accuracy in using hands or fingers	23.1	29.0	-0.10
Computing Skills			
Using a computer, PC, or other types of computerised equipment	42.0	10.4	0.63
Level of computer usage1[c]	29.2	6.1	0.27

Source: Green et al (2000) Table 4.9, Page 95.
Notes:
[a] Work skills were self-assessed by job-holders against the 5-point scale: 'Essential/Very Important/Fairly Important/Not very important/Not at all important or does not apply'. A skill increase (decrease) is defined as a move up (down) one or more points of this scale between 1992 and 1997.
[b] Calculated as the average number of places moved up or down the skill response scale. A positive means a skill increase, while a negative means a skill decrease
[c] Assessed on a scale: 'Straightforward/Moderate/Complex/Advanced', using examples
The base is all those who were in employment both in 1997 at the date of interview and five years earlier.

2.43 On the other hand, with manual skills, the proportion reporting a decrease exceed those reporting an increase and the 'average' shows a significant reduction in usage. These changes in all 4 skill 'sets' applied to both men and women.

2.44 Green (1999) has also attempted to gauge the extent to which the demand for transferable skills is increasing by reference to the market value of such skills, as measured by the wage premium that people with higher levels of generic skills obtain over and above otherwise comparable workers.

2.45 The results from the study support the conclusions drawn from the analyses already reported and add some further insights:

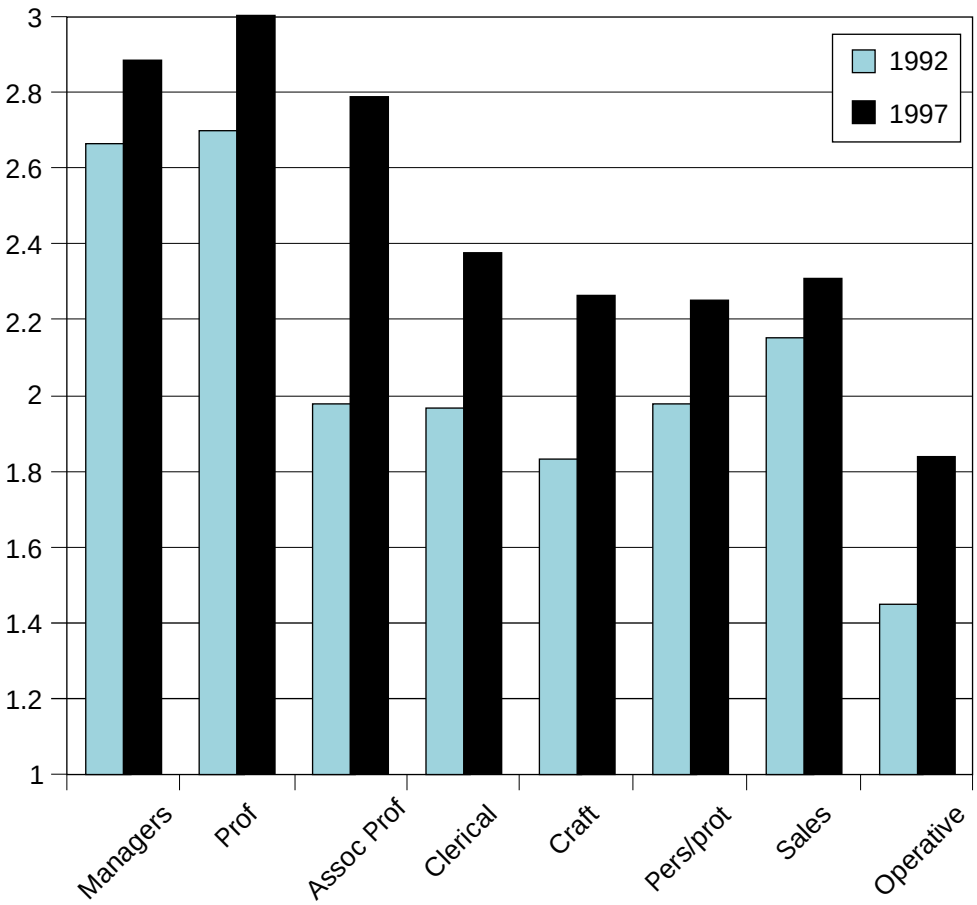
- 'Professional' communication skills and problem solving skills are highly valued in the labour market and carry a premium in terms of salary.
- However, skills such as planning, 'client communication' and 'horizontal

communication' do not appear to carry an income premium, despite being in increasing demand

- There is some evidence that organised teamwork skills are relatively highly valued

2.46 Felstead et al (2000) combine problem solving, communication and social skills referring to them as 'new skills' and examines how these have changed across different occupations (see Table 2.8 and Figure 2.10). The figures in the table are scores constructed by the authors based on subtracting the importance rating individuals gave to tasks in 1992 from the importance rating they gave five years later.

Figure 2.10: Trends in 'new skills' by occupation, 1992-1997



Source: Felstead et al (2000) Table 4, Page 722

Table 2.8 Average skills score: by occupation, 1992 and 1997

Jobs	'New skills'		Computing skills	
	1992	1997	1992	1997
Managers	2.66	2.89	1.24	1.71
Professionals	2.70	3.00	1.70	2.13
Ass profs	2.45	2.79	1.41	1.91
Clerical & secretarial	1.97	2.38	1.39	1.89
Craft & related	1.83	2.26	0.67	0.88
Personal/protective service	1.99	2.25	0.39	0.65
Sales	2.16	2.32	0.63	0.91
Plant & machine operatives	1.46	1.84	0.41	0.65
Other	1.22	1.48	0.10	0.19

Source: Felstead et al (2000) Table 4, Page 722

2.47 As far as 'new skills' overall are concerned, the demand for them across all occupational groups appears to be growing. Nonetheless, the increase is greatest in the 'middle' range of occupations – associate professional, clerical and craft – as well as in operative occupations. However, with regard to computing skills, the increase in average skills score is greater at the 'higher' levels of the occupational structure.

2.48 Green et al (2001) have undertaken further analysis of computer usage using the Skill Survey. Usage has increase from around 40% of the workforce in 1986 to 70% in 1997.

2.49 How have these changes in skill attributes and generic skills been distributed across the workforce? Felstead et al (2000) have shown that in terms of skill attributes, there has actually been a reduction in workforce inequality both between men and women and across occupations. The highest level of skill increase has in fact been in 'personal and protective services'. However part-time and temporary workers and those working in 'traditional' organisations, in terms of human resource practices, compared to 'modern' work organisations, have seen their skills grow less quickly. This is suggestive of a link between the way in which work is organised and the nature of skills required, such that work itself may facilitate or inhibit skills development. Moreover, in relation to computer use, those at the higher occupational levels are increasing their computer skills faster than those at the lower end.

2.50 Francis Green and his colleagues (Green, Felstead and Gallie, forthcoming) are in the process of updating their 1997 results based on a 2001 survey, the full results of which are due to be published in December, 2001. However, provisional results, have been made available to provide early evidence of recent trends, in order to inform this skills assessment. Three types of evidence are provided: broad skills indicators (measured by the qualifications actually required by employers, the length of training needed for the work being done and the length of time on the job which is needed in order to learn how to do it competently); various generic skills; and job task indicators (relating to job variety, repetitiveness and closeness of supervision).

2.51 In respect of the broad skills indicators, entry requirements (the qualifications that someone would need in order to get the type of job that someone currently has) continue to steadily rise. In response to questions about whether the entry qualifications are required to actually do the job competently, the proportion who indicate that a degree is actually necessary has increased.

2.52 In respect of various generic skills, there appears to be relative stability in patterns of skill use over the last 4 years with only small changes being recorded, though the largest changes are the increasing importance of computers at work and the need for advanced numerical skills.

2.53 Overall, it can be provisionally concluded that the workplace has continued to be upskilled over the last 4 years, a process that this research agenda has documented over the period since 1986. The main conclusions that can be drawn from the provisional results are as follows:

- Across two broad skills indicators, skills usage has continued to expand. In some respects, the increase in skills appears to be as fast as before. In four years the proportion of jobs requiring degrees for recruitment has risen by nearly 3 percentage points. However, there has been if anything a fall in the proportion of jobs where the type of work requires over two years training.

- The skills gap between men and women, which narrowed considerably between 1986 and 1997, continued to narrow between 1997 and 2001. However, employers' demand for degrees rose most in jobs held by men.

- There remains a large gap between the public and the private sector with the former's skill needs being greater but it is worth noting that the fall in the proportion of jobs requiring no qualifications since 1997 has been greater in the private sector.

- There is considerable stability in the usage of specific generic skills. Nevertheless, across a wide range of skills there is a notable upward trend. Skills which have increased the most in usage are: computing skills, writing skills, problem-solving skills and professional communication skills.

- The continued rise of computing skills is particularly strong. Around two thirds say that computers were fairly important, very important or essential in their jobs – an increase of about 10 percentage points since 1997. The gap in computer usage between men and women has narrowed to almost nothing. The average level of complexity of computer use has also been rising.

- Internet use at work is already widespread: it is either fairly important, very important or essential for more than one in three workers. Two thirds of these use it for internal e-mail communications, but very substantial minorities are now using the internet for various business purposes.

- Both formal training and informal learning processes are major ways in which computing skills are acquired. Full-time education is rarely seen as the source of acquiring these skills. Around three-quarters of computer users think that their job performance could be improved if they could acquire more computer skills.

2.54 In summary, our assessment of occupational and qualification trends in the 1990's provides substantial evidence of a significant increase in skills demand. The findings of the Skills Survey in relation to job attributes and generic skills also show a consistent pattern of increasing skills utilisation Britain. All major occupational groups have experienced skill increases, as measured by the variables included in the Skills Survey.

Regional variations in skill requirements

2.55 Felstead (2001) has used the 1997 Skills Survey data to examine trends in skill requirements by region over the period 1992-97 and the key findings are summarised in Tables 2.9 and 2.10. Table 2.9 compares the trends in each region in terms of the skills required of its employed workforce in 1992 and 1997. The figures refer to the proportion of those in work reporting the answer indicated. Skills demand has risen in Britain as a whole. What is of particular interest here is whether 'upskilling' can be detected to the same extent in all the regions of England. Two regions – the North West and the South West – followed the national pattern where all 6 measures of the broad attributes required for the job, increased. In several cases (e.g. on one of the qualifications measures in both regions and the training time measures in the North West) the results were highly statistically significant.

2.56 Two other regions – the North East and East Midlands – are firmly at the other end of the spectrum. Both regions saw skill demand fall on almost all of the 6 measures - some of these falls were large enough to be statistically significant. For example, in East Midlands the proportion of respondents who thought that no qualifications would be required to get the job they had rose significantly from 28 per cent to 36 per cent. At the same time, degrees were becoming less important for jobs in the region – down significantly from 17 per cent in 1992 to 11 per cent in 1997.

2.57 If we rank regions by the level of skills demanded in 1992 and 1997 and then compare their positions, we find that the North West improved considerably from being around 'mid table' on most indicators in 1992 to being on the top of the table with regard to 4 of the 6 indicators in 1997. The South West too, improved on all measures.

2.58 On the other hand, the East Midlands was in the top 3 on 4 of the measures in 1992 but by 1997 had fallen to the bottom of the table on 3 of them. The North East fares even worse. It was in the bottom half of the table on all measures in 1992 but by 1997 was ranked bottom on all measures of skills demand.

2.59 Turning now to what we referred to above as particular skills, Table 2.10 shows that the 'Key Skills' demands of jobs rose significantly in all regions of England over the 1992-1997 period. The figures relate to a score constructed by the author of the study – the higher the score the greater the importance of the skill. In the East Midlands however, the upward movement only just reached a reasonable level of statistical significance (90%), whilst much higher levels of significance were reached in every other region. Moreover, the demand for communication and social skills in the East Midlands failed to increase significantly at all.

2.60 Overall, the 'Key Skills' required of the jobs in the North East rose substantially over the five year period but the demand for team working and problem solving skills in

the region failed to rise significantly despite the fact that for Britain as a whole these skills were more in demand in 1992 than 1997. The only other regions that experienced a 'weak' increase in particular skills were: Yorkshire and the Humber (team working); London (team working); and the South West (problem solving).

Table 2.9: Broad Measures of Skill Demand by Region, 1992-1997

	Qualifications Required to get job				Training Time Needed for Type of Work				Learning Time to Do the Job Well			
	None Required		Degree Required		< 3 Months		> 2 Years		< 1 Month		> 2 Years	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
North East	39.4	45.3	7.0	7.2	67.7	72.6	20.3	16.1	26.7	35.0	17.9	12.1
North West	34.4	24.8 ***	11.0	13.4	66.4	48.2 ***	19.5	36.4 ***	20.2	16.2	22.7	30.5 **
Y & H	43.8	42.0	7.8	11.8	67.4	59.6 *	18.5	27.1 **	17.7	32.0	16.0	13.4
East Midlands	27.8	36.2 *	17.2	10.5 *	59.3	63.7	22.7	21.7	23.1	26.1	22.0	20.7
West Midlands	33.2	35.2	6.9	12.8 **	63.1	62.4	22.5	25.8	20.1	24.0	21.4	26.7
East	36.8	26.9 *	10.1	15.2	65.1	54.1 *	20.2	31.4 **	24.9	21.6	27.8	25.8
London	27.5	21.2 **	23.2	23.3	63.2	58.6	20.9	23.7	17.7	22.7	19.6	22.0
South East	30.1	32.2	19.7	14.4 **	59.1	55.4	22.6	29.4 **	20.8	17.9	22.1	22.7
South West	40.3	25.6 ***	7.5	14.0 **	61.8	53.6 *	22.5	30.9 **	21.4	19.1	25.2	19.1

Chi-squared tests were carried out in each region to assess the significance of the skill changes between 1992 and 1997. *=99% significant, **= 95% significant, *= 90% significant**

Source: Felstead, (2001), Table 3

Note: Shaded boxes indicate falls in skills demand

Table 2.10: Particular Measures of Skill Demand by Region, 1992-1997

	Communication & Social		Teamworking		Computing		Problem Solving		All 'Key Skills'		All 36 Activities	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
North East	1.78	2.03 *	2.77	2.96	0.66	1.18 ***	2.43	2.57	2.03	2.28 ***	NA	2.25 *
North West	1.86	2.26 ***	2.68	2.92 ***	1.03	1.30 ***	2.46	2.74 ***	2.10	2.45 ***	NA	2.45
Y & H	1.81	2.16 ***	2.77	2.86	0.78	1.13 ***	2.52	2.73 ***	2.07	2.37 ***	NA	2.34
East Midlands	2.06	2.14	2.67	2.94 ***	0.77	0.96 *	2.55	2.72 *	2.22	2.36 *	NA	2.34
West Midlands	1.61	2.10 ***	2.55	2.97 ***	0.91	1.26 ***	2.29	2.59 ***	1.90	2.33 ***	NA	2.34
East	1.87	2.19 ***	2.76	3.15 ***	1.04	1.31 ***	2.52	2.89 ***	2.12	2.48 ***	NA	2.46
London	2.06	2.29 ***	2.92	3.02	1.14	1.57 ***	2.57	2.79 ***	2.27	2.54 ***	NA	2.44
South East	1.84	2.23 ***	2.79	3.08 ***	1.14	1.54 ***	2.46	2.86 ***	2.12	2.53 ***	NA	2.44
South West	1.94	2.17 ***	2.53	2.84 ***	0.83	1.29 ***	2.55	2.61	2.13	2.36 ***	NA	2.35

Chi-squared tests were carried out in each region to assess the significance of the skill changes between 1992 and 1997. ***=99% significant, **= 95% significant, *= 90% significant

Source: Felstead, (2001), table 6.

Skill types

2.61 This section of the chapter considers the broad types of skills that are required in order to carry out a wide range of jobs. Four 'types' of skill that have been in increasing demand in recent years, and have been the subject of wide-ranging discussion and debate are considered:

- Basic skills
- Intermediate skills
- Information and communication technology skills
- Management skills

Basic skills

2.62 Basic skills can be defined as 'the ability to read, write and speak in English and use mathematics at a level necessary to function and progress at work and in society in general' (Basic Skills Agency, 1997). A perceived deficiency in basic skills has been the subject of widespread analysis and debate in recent years, most notably in relation to the Moser report (DfEE, 1999). This section is not concerned directly with wider issues about the adequacy or otherwise of the basic skills possessed by the UK workforce. The focus here is upon the demand for basic skills as expressed by employers. A key point to note is that the vast majority of research conducted in this area (see for example the NFER review – Brooks et al, 2000) has been focused on the supply of basic skills, and the implications of low basic skills for an individual's life opportunities. The evidence on the changing demand for basic skills by employers is limited.

2.63 Despite the limited evidence, it is clear that changes in the occupational and sectoral structure of employment have – regardless of any other changes – meant a reduction in the proportion of jobs held by people with low levels of basic skills. In particular, as noted above, the number of people working in manual operative and other elementary occupations has declined substantially. This trend alone has led to an increase in the relative demand for people with at least a minimum level of basic skills.

2.64 A more fundamental issue relates to the question of whether the demand for basic skills has increased over the whole range of occupations, regardless of the overall shift away from manual and/or elementary occupations. The evidence on this is less clear-cut and is based upon a limited number of specific surveys (see Brooks et al, 2000, for a summary). However, it does seem clear that basic skills have become more important to employers. For example, the most recent survey of workplace basic skills conducted by DfEE (1997) found that 45 per cent of employers suggested that literacy and/or numeracy has increased in importance, a trend that appears to have been continuous since at least the early 1990s (Atkinson and Spilsbury, 1993; Frank and Hamilton, 1993).

2.65 Notes of caution regarding the actual extent of basic skill use in the workplace and the relative significance of basic skills to employers have been sounded in two recent studies. Robinson (1997), using data from the Skill Needs in Britain surveys, points out that basic skills gaps within the current workforce are less significant to employers than gaps in a range of generic and IT skills. Coleman and Keep (2001) draw on a recent MORI survey in Scotland to suggest that substantial proportions of employees make little or no use of reading and/or writing skills in the workplace. This suggests that, at least in some occupations and/or regions, people whose basic skill levels are relatively low may be able to undertake some jobs.

2.66 It is clear that there has been, and will continue to be, a decreasing relative demand for occupations that require little or no basic skills. However, the issue needs to placed in the context of the limited concern expressed by employers, at least in surveys that are not explicitly concerned with basic skills. Indeed, it might be argued that limited use of basic skills at work may be evidence of a 'low skills equilibrium' at least in some sectors and/or areas.

Intermediate skills

2.67 Lloyd and Steadman (1999) have reviewed the demand for 'intermediate skills', defined as 'those above routine skills, but below professional ones' (Ryan, 1991). This eclectic group of skills include a range of occupations including traditional skilled trades (e.g. fitters, welders, bricklayers) and a large number of non-craft occupations such as nurses, hairdressers, estate agents, laboratory technicians and sales representatives. The key factor that brings these skills together under one label is the typical qualification level of NVQ3, for which it has been argued that there is a shortage in the UK, as compared with graduate-level (NVQ4) and lower level (NVQ1/2) skills. The issue of skill shortages and gaps in this area is explored more fully in chapter 5; this section focuses upon the demand for intermediate level skills.

2.68 Despite a limited base of reliable and comparable statistical information, it seems clear that there has been an overall increase in the demand for intermediate level skills in recent years. However, this growth has not been even, with a decline in the demand for the skilled engineering trades, but strong growth in intermediate level managerial, technical and service occupations. To a large extent, these changes reflect the changes in industrial structure that have been highlighted in this report. However, technological and organisational changes have also played an important role.

2.69 A central question is the extent to which the level and type of skills required within this broad grouping has changed in recent years. The main survey evidence for this comes from the Skills Survey (Green et al, 1999). This suggests that, for example, craft and related employees were more likely to claim that lengthier training was required in order to undertake their own job, while associate professional and technical employees were more highly qualified than in the past. In terms of 'key skills' it was found that – in common with most other occupational groups – there has been an increased need for problem solving, computing, communication and manual skills, with a decreased need for manual skills.

2.70 Other evidence is more equivocal, revealing a mixture of increasing and decreasing skills across a range of occupational groups, particularly within the craft occupations (see above).

2.71 A review by Mason (2001), based upon the results of the 1999 Survey of Employers of Technical Graduates (Mason, 1999), looks at the extent to which graduates are being recruited into occupations that have previously been filled by people with intermediate skills. The results suggest that graduates are often preferred by employers because of their more developed generic skills, such as information handling and problem solving. However, the survey evidence of employer difficulties in recruiting graduates suggests that concerns about 'quality shortcomings' in some graduate job applicants – in particular, lack of practical work experience and commercial understanding – reflect a continuing demand by employers for the skills and knowledge that are most easily acquired through employment-based intermediate skills training.

2.72 Financial services, employing around one million workers, is one area where there has traditionally been large numbers of workers with intermediate skills and where there has been a major shift from recruiting substantial numbers of qualified school leavers. Graduates have been recruited in increasing numbers, instead of school leavers, with

opportunities to fast track in management positions and there has been a movement away from professional exams and a shift from more general skills to more specialised roles (Storey, 1995). Central computerisation, for example call centres, has deskilled traditional banking jobs. For the remainder of branch employees, Storey (1995) argues that there is a considerable degree of uncertainty as to whether branches are to be limited to sales outlets and require narrow skills or whether they will offer a broad range of services that will require wider and more in-depth skills.

2.73 Other areas such as software development also show some evidence of a range of skill changes. Grundy (1996) argues that there has been a rationalisation of and automation of certain types of work into routine jobs, leading to a development of a gendered division of software labour, with women concentrated in low status 'specialities', such as merging and tidying databases. However, Beirne et al (1998) claim that there are limits to this rationalisation because of the complexity and subtlety of the software projects and the need for tacit skills and informal practices.

2.74 A further key area of research has concerned job changes within the health service. Nurses and midwives have been covering specific medical tasks and extended role functions (Harvey, 1995), although the requirements for higher-level qualifications could be seen as pushing these groups out of the intermediate skills categories. But, despite the potential for expanding number of intermediate occupations within the health service, funding pressure is leading to the greater use of lower skilled assistants (Coyle, 1995).

2.75 An occupational group that has increased very rapidly in numbers in the recent past is 'business and public service associate professionals'. A review of the evidence on changing skill requirements for this group (KPMG, 2001) has suggested that there are three main categories of skill combinations that can be identified within this group:

- 'Traditional' associate professionals, such as legal executives, market researchers and technical insurance underwriters, who require a high level of technical skills, with generic skills and personal attributes. For this group there has been a rise in importance of generic and notably communication skills as they attempt to differentiate the product/service they offer to customers.

- 'Transitional' associate professionals, who tend to require an average level of technical skills. However, high-level generic skills and well-developed personal attributes are the key factors defining the job role. Examples include personnel officers and recruitment consultants. This group is having to acquire greater technical skills as industry specific skills become more important, again to meet customer needs. For example, the movement toward recruitment agencies has led to a demand for industry specific skills.

- 'Generic' associate professionals, such as estate agents and barristers' clerks, requiring a high level of generic skills and personal attributes, but relatively low levels of technical skills have experienced little change. Changes that have occurred have tended to be around additional generic skills, especially basic IT.

2.76 The case study evidence on changing skill requirements is mixed, but Lloyd and Steedman (1999) believe that within craft occupations there has been a change in the nature of tasks away from manual skills to more organisational and technical skills. There is little support for the view that the effect has been to substantially deskill craft workers, with some exceptions, such as the textile and clothing sectors. In the non-craft occupations, it is more difficult to identify general movements in job content. For some areas, such as hairdressing, chefs and sales representatives, there have either been few technological changes or a lack of research into the changing nature of their jobs. The expansion of the service sector has increased the demand for employees at the intermediate level. However, there is evidence in some areas of a polarisation of the workforce, with divisions into a larger group of lower skilled workers undertaking routine operations and fewer, more highly skilled workers with more specialised knowledge.

IT Skills

2.77 In the Skills Survey (1992 and 1997) evidence is clear about the pervasive and growing demand for IT skills across almost all sectors and occupations within the economy (see Table 2.7). This issue has been the focus of considerable research, discussion and debate over a number of years, much of it focused upon the notion that there exists an ongoing 'IT skills crisis' that is significantly restricting the performance of a number of key sectors. While slowdowns in the growth of sectors such as mobile phone production are suggesting that the 'crisis' may be less severe in future, IT remains a crucial issue from the point of view of skills demand.

2.78 In considering 'IT skills' it is important to distinguish between three distinct applications of the term, namely by sector, by occupation or specialist personnel and by IT skills utilisation amongst non ICT specialist staff. The ICT sector is rapidly changing with constantly changing boundaries. The main sectors, as defined by SIC, computing, communications and electronics are converging with increasing blurring of sub-sectors, as electronic products, for example, have software embedded within them. ICT occupations or personnel include people who are employed in a job that is largely dependent upon their skills in information and communication technologies. Most of these people are employed in the non ICT dedicated sectors (such as financial services) although the proportion has been shrinking recently. IT user skills, can be deployed by workers across a wide variety of occupations and sectors. We deal with each of these three below:

ICT Sector

2.79 The ICT sector is an important and developing sector of the economy. Using the Skills Dialogue report definition (IES 2001) it comprises the computing, telecommunications and electronics industries, but on some definitions also includes television and other broadcast media (or specifically those parts concerned with information technologies). The importance of the sector, as defined in the scope of the Skills Dialogue, can be gauged by the fact that it contributes around 8 per cent of UK GDP and 15 per cent of total trade. Employment in the ICT sector grew by 39 per cent between 1995 and 2000, and looks set to continue growing into the future. The greatest growth has been within computer services where employment has almost doubled.

The sector can, of course, include both ICT specialist and non-ICT staff, therefore in exploring the ICT skill demands it is usual to consider specialist personnel who may work within the ICT sector or any other sector of the economy.

ICT Personnel

2.80 There are a range of estimates of the number of people who work in the ICT sector or as ICT specialists, depending both on the source of the data and on the definitions used. According to the Skills Dialogue report (IES, 2001), slightly more than one million people are employed in a job which is largely dependent on their skills in information and communication technologies, whether in the ICT dedicated or non-dedicated sectors. Most are employed in the non-ICT dedicated sector, although the gap has been shrinking recently.

2.81 ICT personnel tend to be younger than the average for all employees, and ICT work is strongly clustered in and around London and the South East. Representation of women in the ICT work is low (accounting for just 13% of jobs) both in comparison to other sectors and to our international competitors.

2.82 The demand for skills amongst the ICT specialists both in the ICT dedicated and non-dedicated sectors and in the ICT sector as a whole has been most recently and comprehensively examined in the ICT Employer Skills Survey (Morrell and Smith). The key findings from this survey, summarised in the Skills Dialogue, include:

- In terms of technical skills, the overwhelming demand is for the core fundamental skills associated with the Windows/NT operating systems.

- Skills in Microsoft applications, notably MS Access, MS Office and MS Publisher are also in increasing demand.

- For professional technicians and engineers involved in product development, and to a lesser extent for sales and marketing staff, skills in C and C++ programming are important.

- There is a growing, but still relatively low demand overall for skills in Internet-related areas such as HTML and Javascript. Demand is growing faster for skills in specific areas such as internet design

- While technical skills are important, many respondents to the ICT employer skills survey highlighted the need for appropriate combinations of technical and business/personal skills, in particular:

  - ➢ There is a need for ICT staff to combine technical skill with the ability to work with other fellow professionals and/or with internal and external customers

  - ➢ ICT staff need to be capable of working within a rapidly changing environment, which involves working flexibly and imaginatively

  - ➢ ICT professionals need to be customer sensitive and to apply their skills in an integrated business environment

- Building on the above, the most important 'generic skills' required by ICT staff – depending upon the specific nature of their role – are the following:

  - ➢ Problem solving
  - ➢ Oral communication skills
  - ➢ Team working skills
  - ➢ General IT user skills
  - ➢ Customer handling
  - ➢ Numeracy

IT user skills

2.83 While the ICT sector is a major source of demand for IT skills, employers in sectors as diverse as the land based industries, financial services and construction are almost unanimous in their view that the demand for IT skills has increased over recent years and will continue to increase significantly in the future. Indeed, it might be argued that computer literacy – or at a minimum some level of keyboard skills – will become a basic requirement for all but a relatively small proportion of jobs and occupations in the future. The extent to which higher or lower-level IT skills will be required by non-IT workers is less clear and depends upon a range of factors including developments in computer technology and in work organisation. Three recent studies illustrate this point.

2.84 Green (1999), using data from the 1997 Skills Survey examined the extent to which the possession of computer-related skills attract a premium in terms of higher wages, as an indication of the level of demand for those skills. His findings suggest the existence of a significant wage premium, even for those workers involved in using computers at relatively low levels of complexity. More complex computer use earns a still higher premium. People who use computers at work earn, on average, around 21 per cent more than otherwise similar people that do not use computers, with an estimated 47 per cent premium for those involved in activities such as programming.

2.85 Finally, a more qualitatively based study by the Institute for Employment Studies (2000) looks at the skills implications of electronic retailing. While acknowledging the need for a range of technical IT skills related to e-retailing (e.g. use of relevant computer languages, database development), a key finding is that these skills need to be combined with management, marketing, customer service and 'generic' skills such as 'entrepreneurship' and a broad understanding of the business context. The theme of the need for appropriate combinations of technical IT skills, managerial and generic skills was also identified in the work conducted for the Skills Dialogue amongst ICT specialists as highlighted above.

Management skills

2.86 As demonstrated in the analysis of occupational trends (above), managerial occupations – and more particularly 'corporate managers' – have been one of the most

rapidly growing groups within the workforce. This section reviews, briefly, the evidence regarding the changing nature of the demand for management skills. The focus is primarily upon those people whose main role is a 'manager', but it should be noted that management skills can be important within a range of jobs that are not, strictly speaking, within the management occupational group.

2.87 This section draws heavily upon three recent review papers - Johnson and Winterton (1999), Bosworth (1999) and particularly Winterton et al (2000). The Winterton et al review considers the future skill needs of managers, and highlights a number of major influences that are shaping the changing demand for managerial skills, including:

- Political changes, such as widespread deregulation and privatisation of economic activities, the influence of EU regulations and growing environmental regulation.

- Economic influences, notably increased competition, globalisation, the restructuring of world markets and the growth of the small and medium size enterprise (SME) sector.

- Social trends, including increased female participation in the workforce and changing patterns of work.

- Changes in technology that are affecting almost all areas of economic activity, but in particular the pervasive influence of information and communications technologies, the Internet and the rapid development of e-commerce.

- Organisational restructuring (often related to the above changes), including de-layering, downsizing, outsourcing, business process re-engineering etc.

2.88 According to Winterton et al, these changes have had, and will continue to have, a profound effect upon the range of skills that are required of managers in modern organisations across all sectors and types of organisation. The types of skills that the modern manager needs to possess to a greater extent than previously include:

- A range of 'knowledge and cognitive competences', such as leadership skills, international awareness, innovation, management of change and flexibility.
- Functional competences, including strategic management, entrepreneurship and the management of smaller organisations or units.

- Personal competencies, notably facilitation skills, cultural awareness, self-reliance and adaptability to changing environments.

- Ethical competencies, including the ability to deal with a range of stakeholders, influencing skills and environmental awareness.

- Finally, a collection of 'meta-competencies' relating to the ability to deal with uncertainty, instinct, judgement and the capacity to learn more quickly than the competition.

Sectoral Evidence from Skills Dialogues

2.89 A range of useful information about trends in skill requirements is available from the series of 'Skills Dialogues', which focus upon specific sectors. These reports combine the 'Skills Foresight' studies produced by the National Training Organisations with the results of wider analysis and consultations with sector representatives and experts. The Skills Dialogue programme is designed to cover all major employment sectors, and this final section of the chapter presents some key points from the reports completed to date covering the following sectors:

- Construction and related sectors
- Engineering
- Financial services
- Land-based industries

Construction and related sectors

2.90 The Skills Dialogue for the construction and related sectors covers a wide range of activities that 'contribute to the development of the nation's built environment' (Business Strategies, 2000). This includes three broad sectors, namely:

- Construction and specialist contractors
- Extraction and processing of raw materials
- Professional services related to construction

2.91 Estimates by Business Strategies and IER suggest that the construction and related sectors remain very important in terms of employment, despite an overall decline since 1990. Including the self employed, the sector accounts for around 1.8 million workers (Business Strategies, 2000, Table 1.1 and Annex Table 2.2) and exhibits strongly cyclical employment patterns.

2.92 The Skills Dialogue for the sector makes the following points about trends in occupations and skills:

- The construction and contracting sub-sector (which accounts for over two-thirds of the sector's employment) relies heavily on craft workers and technicians, who make up almost 50 per cent of the total workforce.
- In contrast, unskilled manual workers dominate extraction and processing, although technical and professional skills play an important role.
- Manual workers play a very limited role in the professional services sub-sector.

2.93 There are a number of important factors that are driving changes in skill demand within the construction and related sectors, including:

- A drive towards more effective supply chain management, increased use of prefabrication and a clearer focus on customer care, as suggested by the influential Egan Report (1998).

- The need to raise rates of productivity increase within the sector nearer to the average for all sectors, prompting a call for more multi-skilling and a general need to increase skill levels and qualifications.

- Changing technology, notably the introduction of ICT into a range of construction-related activities. This is most obvious in relation to professional services such as design and architecture, but is also affecting project management and other technical skills.

- Increased competition and the internationalisation of many parts of the sector, coupled with constantly changing regulations and a need to address issues of sustainability, all have implications for skills demand.

- Labour turnover in the sector, for example high rates of retirement among older workers and relatively low entry rates, suggest that the replacement demand (on which see 3.20 ff) for workers in the sector will be considerable (between 65,000 and 75,000 per year), despite a projected net decrease in employment.

- Specific changes in occupational demand that have occurred in the recent past and are expected into the future include:

  - ➢ An increased demand for managerial, professional and technical workers, but at a lower rate of increase than the economy as a whole.

  - ➢ A continued decline in the demand for manual craft skills, both in engineering and in specific construction skills.

  - ➢ The number of operatives and related workers demanded by the sector will remain broadly stable, or indeed increase slightly, despite a decrease in demand for such workers in the labour market as a whole.

2.94 In terms of the types of skills required by workers in the sector, the following points are made:

- For skilled and semi-skilled construction workers, there is a continued emphasis upon manual skills, as opposed to wider generic skills.

- However, there are indications that there is an increasing need for such workers to plan work and to communicate effectively with fellow workers.

- Project management skills are in increasing demand, particularly within larger contractors, but also within smaller sub-contractors.

- There is an increasing demand for ICT skills, concentrated mainly in the professional services sub-sector, but also among technical and managerial staff.

Engineering skills

2.95 Despite a long-term decline in employment between the early 1970s and the mid 1990s, the engineering sector remains a very important component of the UK economy, representing around 8 per cent of total UK GDP (Wilson, 2000) and more than one-third of UK exports. In terms of employment, an estimated 2.5 million people have jobs that have an engineering component and 1.3 million are in substantially engineering occupations, some working outside the engineering sector.

2.96 The engineering sector, as defined in the latest Skills Dialogue report (Institute for Employment Studies, 2000), accounts for around 1.8 million employees, including 40,000 in the engineering construction industry. The performance of the engineering sector in the recent past has been highly diverse, with electronics being among the best performing sectors in the UK economy, but metal manufacturing and fabrications having declined substantially.

2.97 While the decline in engineering sector employment was arrested for a short period between 1995 and 1998, the prospects are for a continued decline in total employment, albeit at a slower rate than the 1970s and 1980s. In relation to the demand for specific occupations and skills the following changes are having – and will continue to have – an important influence:

- New working practices, such as cell and team working.
- Structural changes in the sector, such as the growth of outsourcing and the devolution of responsibilities down the supply chain.
- Technological change, such as the automation of production lines, increasing use of robotics, developments in ICT and e-commerce.
- An increasing emphasis upon customer service, with customers being more demanding.
- Structural changes such as globalisation on the one hand, and flatter organisational structures and a declining average size of business on the other.
- Greater environmental concerns and safety awareness.

2.98 Although there is likely to be a net decline in total employment in the engineering sector over the coming few years, some sub-sectors, particularly electronics, are likely to continue growing. Moreover, estimates suggest that there will be a replacement demand of around 37,000 per year to take account of retirement and people changing occupations. The occupations that are most likely to be in increased demand by engineering employers are corporate managers, scientific and technical staff (most notably software engineers) and skilled metal and electrical trades. In addition to this

continued shift towards 'higher level' occupations, there will be considerable changes in the skills required across the board and within specific occupational groups in the sector:

- A range of new and specific technical skill requirements will continue to arise as a result of technological changes such as the introduction of new materials and process technologies.

- Computer literacy and IT skills will be required at all occupational levels, from keyboard skills at the production level to the use of sophisticated design and process control software by professional and managerial staff.

- There will be a continued trend towards multi-skilling and workers will be required to work flexibly, as a result of technical and organisational changes, and reduced demarcation.

- More generally, workers will need to be able to deal with continued change and acquire the skills needed to engage in continual learning.

- Personal and generic skills – such as communication, team working, problem solving, personal initiative and organisational skills – will be increasingly in demand from all workers in the sector.

- Increased awareness of the needs of customers will be an important generic skill area, not just for those who are dealing directly with customers. Production workers need to pay more attention to issues such as product quality and the importance of delivery dates.

Financial services

2.99 The financial service sector – incorporating banks, building societies, insurance, financial intermediation and accountancy – is one of the UK's most important in terms of its global position. On a narrow definition (KPMG, 2001) the sector employs 1.65 million people, around 9 per cent of the total workforce, but accounts for 14 per cent of UK GDP. In addition to the core activities noted above, the sector embraces two important 'cross-cutting' areas, namely call centres and Independent Financial Advisers (IFA).
2.100 The sector has grown by around 2% per annum in recent years. Employment in banking and finance has declined by 6% between 1991-98 while professional financial services employment has witnessed particularly rapid growth, which looks set to continue. In terms of occupations, the sector is dominated by a small number of key groups:

- Corporate managers, which have accounted for an increasing share of employment over the past two decades, making up around 8 per cent of banking and finance employees and over 12 per cent in insurance and professional services.

- Business and public service professionals and associate professionals, including for example accountants, accounting technicians, finance

specialists, actuaries, stockbrokers and fund managers. These groups are particularly important in the insurance and professional services sub-sectors.

- Administrative and clerical workers, who make up over 50 per cent of employees in banking and finance, a proportion that has, however, been slightly declining sector wide. Similarly, secretarial and related staff have declined in relative importance across the sector, whereas the proportion of 'elementary clerical and service occupations (e.g. data input) has remained constant at around 3 per cent in insurance to 6 per cent in banking, finance and professional services.

2.101 While the financial services sector has been a major growth area, and has experienced relatively few skill problems due to its ability to pay relatively high salaries, the Skills Dialogue report points out that a number of key changes are likely to affect the number and type of skills demanded by employers in the sector. These include:

- Increasing regulatory pressure has tightened the need for technically correct and competent selling and delivery of financial services in some sub-sectors, such as insurance and amongst IFAs. This has influenced companies training needs.

- Continuing rapid change in the use of ICT within the sector will mean a continuing growth in demand for people with high level IT skills, and higher IT user skills more generally. This means IT specialists are needed, notably in the design and operation of websites, online services etc. At the lower occupational levels, for instance in call centres, relatively high levels of computer literacy and keyboard skills will be required.

- Personal and generic skills such as communication, team working and the creativity required in order to develop and/or adapt services, will be in great demand by financial service employers. More generally, the sector will continue to be highly competitive and subject to rapid change, and the skills and attributes required to cope with these changes will be at a premium.

- Finally, as with most other sectors, an increased focus on customer service and the development of customer focused products, will lead to an increased demand for skills in this area.

Land based industries

2.102 The land-based sector of employment comprises just under one million people, according to the estimates of LANTRA (2001). The largest single group of employees (around 48 per cent) within the sector works in agriculture, but the land-based sector comprises other related industries such as landscaping, horticulture, animal care and environmental conservation. While the sector is small relative to many other sectors discussed in this report, and employment is declining (particularly in agriculture), it is still an important component of the UK economy and is linked with other growing sectors, notably tourism.

2.103 The LANTRA Skills Foresight report was written prior to the onset of the 2001 foot and mouth crisis, but still projects a continuing decline in employment in agriculture. However, employment is set to increase over the coming five years in other sub-sectors, notably environmental conservation, equine, horticulture and landscaping. The net result is a projected modest increase of 12,600 in the total land-based workforce by 2006. Moreover, an ageing workforce means that replacement demand will be relatively high, at around 85,000 per year.

2.104 In terms of occupations, there will continue to be a decline in demand for semi-skilled and unskilled land-based workers, but a considerable increase in demand for managers and supervisors (excluding owner-managers), sales and administration staff and, to a lesser extent, skilled manual workers. The main drivers of changes in skill demand within the land-based industries are:

- Changes in technology
- More knowledge-driven methods of working
- Increases in productivity
- Commercial pressures
- Demand for higher quality products and services
- Increasing concerns with environmental issues
- Health and safety issues

2.105 The net impact of all of these changes is a significant increase in the average level of qualifications required of land-based workers, and greater demand for a range of specific craft, practical and technical skills. Information and communications technologies are also becoming prominent in the sector, particularly for managers, supervisors and owner-managers.

2.106 In addition to technical and ICT skills, reports suggest that there is likely to be increased demand within the sector for management and business skills (as a result of increased competition) and a range of generic skills, notably communications, team working, problem solving and the ability to work unsupervised and make decisions effectively.

Key Findings

This review of the evidence regarding recent changes in the demand for occupations and skills in Britain has revealed a number of key points that need to be considered in addressing the overall skill needs of the economy in the future:

- ❑ Changes in the sectoral structure of employment, which occurred at a rapid rate during the 1980s, have continued into the late 1990s, albeit on a less dramatic scale:
  - ➢ There has been a continued growth in the number and proportion of people employed in the financial and business services sector.

- ➢ Distribution and transport have also been areas of significant employment growth.
- ➢ 'Non-market' service employment has increased, but at a slower rate than during the 1980s.
- ➢ At the other end of the scale, the manufacturing and primary sectors have witnessed a continued decline in employment, although there is some evidence that there has been a slowdown in the rate of decline of manufacturing.

❑ These changes are responsible, to some extent, for the changes in the occupational structure of employment that have been witnessed over the same time period:

- ➢ There has been a continued rapid growth in the absolute number of, and relative importance of, managerial, professional and associate professional occupations.
- ➢ Service occupations have also grown, but to a lesser extent than managerial and professional occupations.
- ➢ At the same time, operative and elementary occupations have reduced in absolute and relative importance, although there is an indication that the decline in absolute numbers is tailing off.
- ➢ The demand for craft and related workers has fallen, but at a lower rate than for operatives.

❑ However, broad occupational trends do not tell the whole story, as the occupational structure of employment within most major sectors of the British economy has also changed significantly, exacerbating the occupational change that would have occurred solely as a result of sectoral changes. In particular, the proportion of managerial and professional staff employed has increased across most sectors, including manufacturing.

❑ 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 with particularly strong growth in managerial, professional and associate professional/technical jobs in London and the South East whilst growth in these occupations has been very modest in the North East. However, in terms of absolute numbers, London and the South East has 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.

❑ In general, the qualifications held by people employed in most types of occupation have increased markedly over the 1990s. For example, 45% of the workforce in 1999 was qualified to NVQ3 or above, compared with 33% in 1992. Conversely, the proportion of the workforce with no qualifications declined from 25% in 1992 to 13% in 1999. To the extent that formal qualifications measure skill levels, this provides clear evidence of an overall increase in the demand for skills throughout the economy, though it is important to note that there is no overall increase in the proportion of people qualified to level 3.

❑ However there are significant differences in the growth of qualifications held across occupations with the strongest growth in 'higher level' qualifications being amongst managerial, clerical and sales occupational groups.

- More detailed investigations of the types of skills that are required in order to do a range of jobs also suggest an across the board increase in skill levels demanded, in virtually all occupations. Most jobs needed more training, and more learning time to do the job effectively, in 1997 than they did in 1992, though there are variations across different occupations, and much higher levels of technical and (particularly) generic and IT skills are needed, according to the responses of individuals to detailed survey questions.

- These skill increases are generally greater amongst women but apply across both younger and older members of the employed labour force.

- The Skills Survey research suggests that these increases in skill levels have occurred across most regions of the country, with some exceptions. In particular, upskilling appears to have been strongest in the North West and South West overall, with overall deskilling being apparent in the North East and East Midlands. There are also some important differences relating to particular skill types such as communication and team working.

- The available evidence suggests that, while there is a need for increased technical and job-specific skills, there is also an increased demand for a range of 'skill types' that cut across sectors and occupations, including:
  - **Basic skills**: very few jobs can now be done without at least a basic level of literacy and/or numeracy.
  - There has been an increased demand for '**intermediate skills**' i.e. skills that are above the routine level, but below professional skills.
  - **Generic skills** such as problem solving, communication and team working are in increasing demand, the precise extent and nature of which varies across different occupations and sectors
  - There has been a pervasive and significant increase in the demand for **IT skills**, ranging from basic keyboard skills and computer literacy through to advanced programming and Internet skills.
  - The demand for **management skills**, both within the managerial occupational group and beyond, has increased significantly. Moreover the nature of the skills required of managers is changing rapidly, with a growth in the demand for, amongst others, leadership skills, entrepreneurship, cultural awareness and adaptability to change.

- A review of the changing demand for skills in a range of sectors suggests that, while there are issues that are specific to each sector, the broad trends identified in this chapter are consistent across sectors.

- The sectoral reviews also throw important light upon the main factors that have driven, and will continue to drive, the demand for skills by employers. While the emphasis varies by industry, most sectors have been faced with the following types of factors that have influenced skill demand:
  - Rapid **technological change**, with a particular emphasis on ICT, but also including a range of product and process innovations in sectors such as engineering and financial services.
  - Increased **competition**, often on a European and/or global scale. This has, among other things, increased the emphasis placed by many employers on customer handling skills among their staff.

- **Structural changes**, such as the globalisation of some organisations and the dividing of others into smaller units, have had a crucial influence, particularly upon the managerial skills that are needed at all levels.
- Changes in **working practices**, such as the introduction of team or cell based production in engineering, or call centres in financial services, have made particular demands upon the generic skills required in a range of sectors and occupations.
- Finally, a number of **regulatory** changes (e.g. in construction or financial services) and increased concern about **environmental** issues (affecting, for example, the land-based industries) play an important role in skill demand for some key sectors.

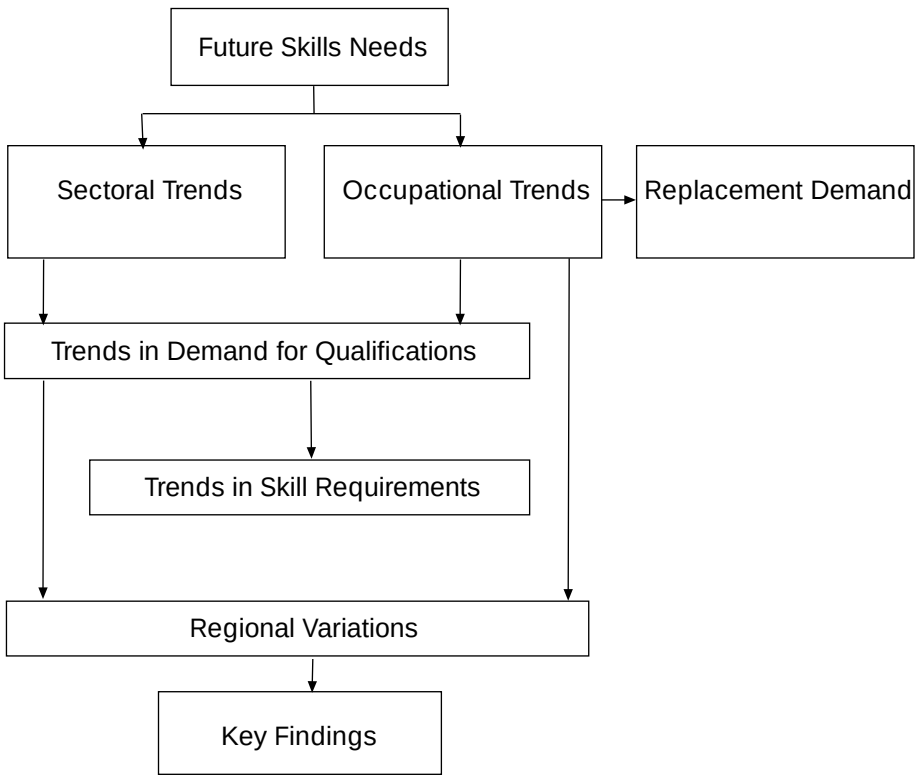
Chapter 3

Future Skill Needs

The previous chapter examined recent and current trends in skills demand. This chapter seeks to look into the future with a view to finding out what skills are likely to be required over the coming decade. What are employers requirements likely to be? How is the economy and labour market changing in relation to its skill requirements? Broadly, it focuses in turn on our three dimensions of skills – occupations, qualifications and generic skills.

The chapter first draws attention to likely changes in economic structure, employment status and gender before considering expected trends in occupational structure at the level of 9, 25 and 81 occupational groupings. It then goes on to consider the importance of replacement demand, for which estimates are provided, before turning to changes in qualification requirements. Finally, it examines possible changes in the demand for generic skills, concluding with an assessment of how each of our three dimensions of skills are likely to develop across the different regions of England over the coming decade.

The structure of the chapter is illustrated in the orientation chart below:



This chapter draws heavily on the forecasts of occupations and qualifications produced by IER (Wilson 2001a, 2001b) to which readers are referred for extensive results and an explanation of the basis and modelling procedure on which they are based. More detailed results are also available on the skillsbase website (www.skillsbase.dfes.gov.uk).

Sectoral Trends

Changes in Economic Structure

3.1 Changes in the 'sectoral' composition of employment have significant consequences for the kind of skills that are likely to be required and significant changes in the structure of employment in the UK are expected to take place over the next few years (see table 3.1). Over the period 1999-2010 it is anticipated that employment in the primary and manufacturing sectors are likely to fall. On the other hand growth is anticipated especially in business and other services, non-market services and distribution.

Table 3.1: Employment in the U.K. by Broad Sector, 1999-2010

	Change in Nos Employed 1999-2010 (in '000)	% Share of Employment in 2010
Primary	-137	2.0
Manufacturing	-713	12.1
Construction	+7	6.0
Distribution	+628	28.2
Business and other services	+1774	28.7
Non Market services	+562	23.0
Total	+2127	100

Source Wilson (2001a) Table 3.2, Page 15

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.

Employment Status and Gender

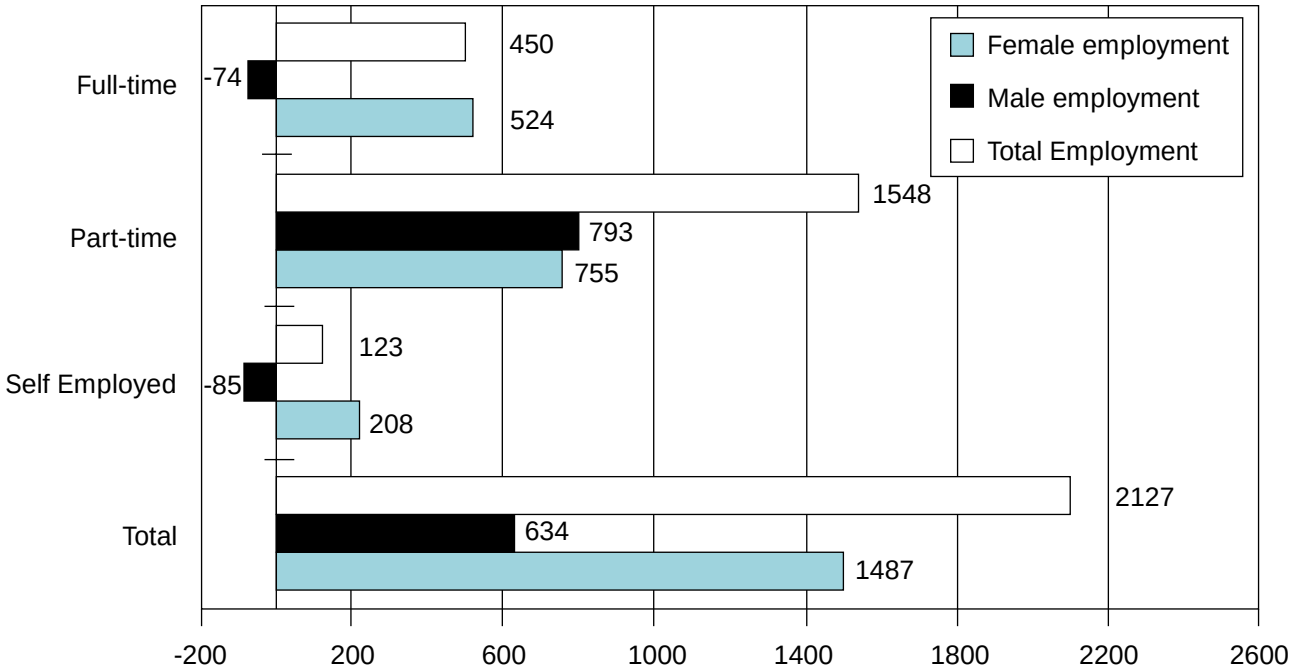
3.2 Changes in the sectoral composition of employment have implications for the balance of employment status (as between full time and part-time employment and as between employees and self employment) and for the gender composition of employment. The expected decline of employment in the primary and manufacturing sectors is likely to result primarily in the loss of full-time jobs, most of which have traditionally been held by men.

3.3 In contrast, the growth of jobs in the various service sectors are likely to create more opportunities for women, particularly in part-time jobs, as the majority of these jobs have mostly been held by women. Currently women account for 46% of total employment – 37% of full time employment but 76% of part time employment and only 27% of self employment.

3.4 Figure 3.1 shows how the position with regard to employment status and gender for the UK workforce is expected to change in the period up to 2010. Whilst both male

and female employment are expected to continue to increase, female employment is expected to grow more than 3 times faster than male employment. Male full time employment is expected to fall, whilst female full time employment continues to grow. The growth in part time employment is also considerable (accounting for around three-quarters of total jobs growth), particularly amongst males, as a proportion of the existing level of part-time male employment. The scale of self-employment is projected to change little with the total numbers rising only modestly.

Figure 3.1 Changes in Employment Status and Gender, 1999-2010 ('000)



Source: Wilson (2001a) Table 3.5, Page 18

Occupational Trends

3.5 The occupational structure of employment is also likely to change considerably over the coming decade. Growth will be fastest in professional, associate professional/technical and personal service occupations. In consequence, substantial flexibility and skills development will be required in order to adapt to these evolving labour market requirements.

3.6 The main forces driving changes in the occupational structure of employment are the sectoral composition of output (itself a function of changing consumer demand and patterns of national competitive advantage); organisational changes; and technological change. Together these structure the kinds of jobs that people do.

3.7 For example, the decline of manufacturing employment results in a decline of skilled craft workers and operatives. In contrast, the growth of service sector employment leads to the expansion of jobs in other occupations. The growth of non-marketed public service employment, for example, leads to additional jobs for professional, managerial and clerical workers in public administration; for doctors and nurses in health services; and for teachers in education services. Similarly, the growth in

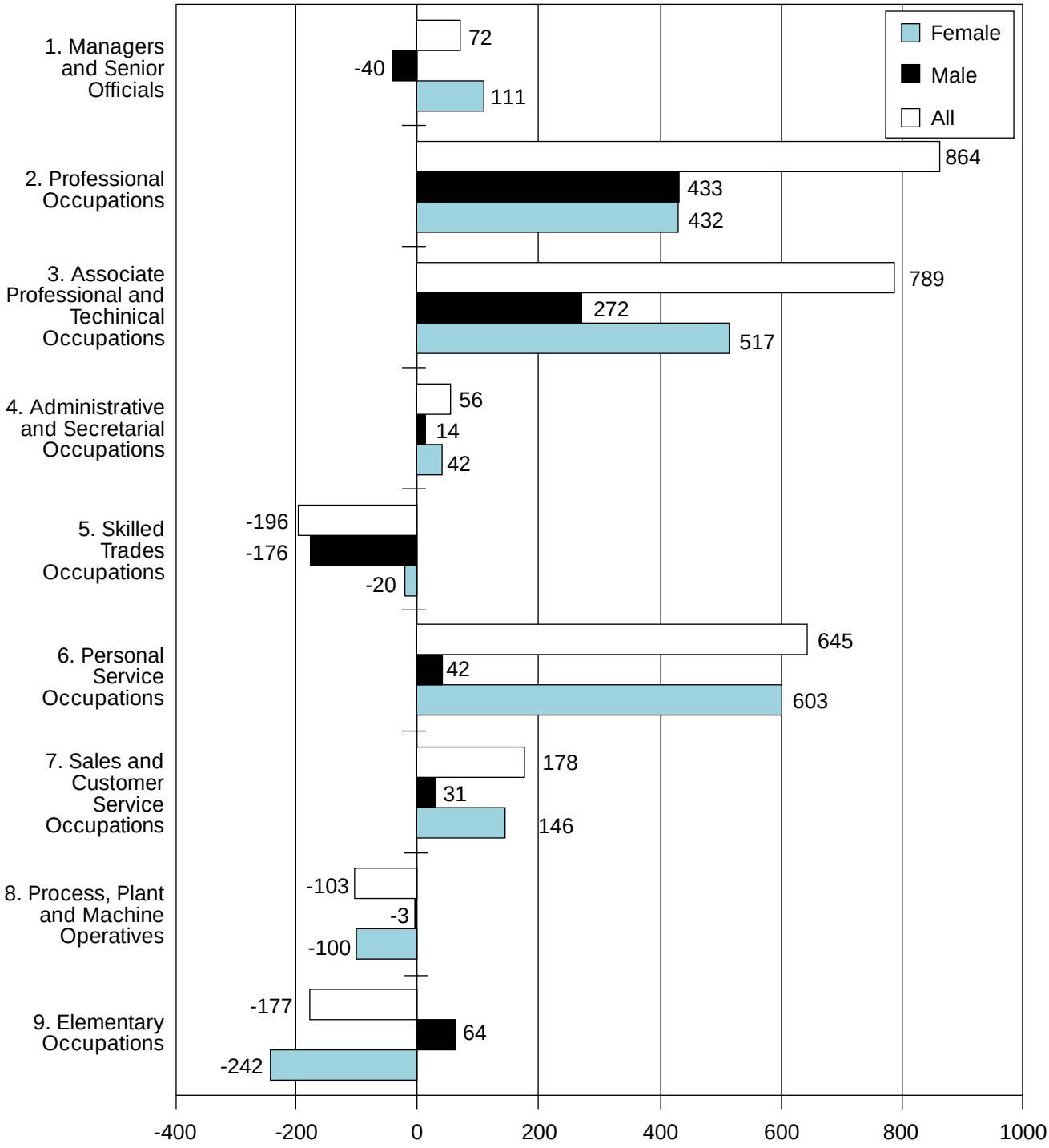
private sector marketed services results in new jobs for leisure and other personal service occupations (for example in hotels, catering and miscellaneous services); sales occupations in retail distribution; and for professional, associate professional, clerical and secretarial in business and financial services.

3.8 These links between expected sectoral and occupational trends are reinforced by changes in the nature of many jobs within particular sectors, the restructuring of the way that work is organised and technological changes. The application of information technology and its integration with communication technology is especially important. For example, many clerical and secretarial jobs which were previously concerned with informaiton processing using paper technology are being lost. On the other hand, information technology has opened up new areas where information services can be provided. This tends to create jobs of a professional, associate professional and managerial nature. The application of IT in other areas such as manufacturing leads to the displacement of many skilled workers as their jobs have been taken over by computer controlled machinery, such as robots in motor manufacturing and assembly.

3.9 The impacts of information technology and organisational changes are likely to further reduce the demand for clerical and basic secretarial skills. The introduction of new technologies in manufacturing will tend to displace many skilled manual workers. On the other hand, the management and operation of the new technologies will require increased employment for managerial, professional and associate professional occupations, including technicians of various kinds.

3.10 What then are likely to be the main trends in the future pattern of occupations? An assessment of future changes in the occupational structure by gender of the UK for the period to 2010 is set out in figure 3.2. At the level of the 9 major occupational groups, the occupations expected to show the most significant increases over the next decade are: Professionals (+864,000); Associate Professionals/Technical Occupations (+789,000); and Personal Service Occupations (+645,000). Smaller increases are expected for sales and customer service occupations (+178,000) as well as managers and senior officials (+77,000).

Figure 3.2: Occupational Change by Gender, U.K., 1999 - 2010 (in '000s)



Source: Wilson (2001) Figure 4.2, Page 28

3.11 For men, the biggest increases are in the professional (+403,000) and associate professional (+272,000) occupations whilst for women they are in the personal services (+603,000); associate professional (+517,000); and professional (+432,000) occupations. 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 employed, as well as full time jobs, is expected. On the other hand, amongst managers, the main growth is in full time employment. In both administrative/clerical/secretarial occupations and in sales and customers services, there is likely to be a substantial growth in part-time employment offsetting a sharp decline in full time working. Significant reductions in

employment, in contrast, are expected in skilled trades (-196,000); process, plant and machinery operatives (-103,000); and elementary occupations (-177,000).

3.12 These projected trends are largely a continuation of trends over the last 20 years. Significant increases in white collar, non-manual employment, especially in the service sectors, whilst blue collar, manual jobs, largely but not exclusively associated with manufacturing and primary sectors, have declined. There is one major exception to this long run trend. In the administrative and secretarial occupations sector, 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.

3.13 We now go on to examine occupational changes at the more detailed level of the 25 'sub major' occupational groups (see table 3.2). This enables us to obtain a more 'finely grained' understanding of the likely changes, at a level more useful to policy and decision makers. 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. Indeed taken together, these 6 groups 'account for' nearly 85 % of the expected job growth over the decade.

3.14 Despite modest absolute growth in the cases of administrative and clerical occupations and sales occupations; and an actual decline in employment in clerical and services related elementary occupations, these three occupational groups will remain, along with corporate managers, the largest 4 occupational sectors of the economy together accounting for nearly 35% of total employment.

Table 3.2: Occupational Change 1999-2010

	Level (000) 1999	Level (000) 2010	Change 1999-2010	% share 1999	% sharess 2010
Corporate Managers	2669	2891	222	9.7	9.7
Managers/Proprietors in agriculture and services	978	827	-151	3.5	2.8
Science and Technology Professionals	895	1147	252	3.2	3.9
Health Professionals	244	339	95	0.9	1.1
Teaching and Research Professionals	1206	1463	257	4.4	4.9
Business and Public Service Professionals	710	971	261	2.6	3.3
Science and Technology Associate Professionals	401	402	1	1.5	1.4
Health and Social Welfare Associate Professionals	884	1105	221	3.2	3.7
Protective Service Occupations	268	322	54	1.0	1.1
Culture, Media and Sports Occupations	498	646	149	1.8	2.2
Business and Public Service Associate Professionals	1393	1756	363	5.1	5.9
Administrative and Clerical Occupations	2905	3065	160	10.5	10.3
Secretarial and Related Occupations	1141	1038	-104	4.1	3.5
Skilled Agricultural Trades	328	290	-39	1.2	1.0
Skilled Metal and Electrical Trades	1545	1432	-114	5.6	4.8
Skilled Construction and Building Trades	1001	936	-65	3.6	3.2
Textiles, Printing and Other Skilled Trades	905	926	21	3.3	3.1
Caring Personal Service Occupations	1034	1505	471	3.8	5.1
Leisure and Other Personal Service Occupations	560	735	174	2.0	2.5
Sales Occupations	1714	1886	172	6.2	6.4
Customer Service Occupations	101	107	6	0.4	0.4
Process, Plant and Machine Operatives	1499	1373	-126	5.4	4.6
Transport and Mobile Machine Drivers and Operatives	947	969	23	3.4	3.3
Elementary Occupations: Trades, Plant and Machine Related	1030	1007	-23	3.7	3.4
Elementary Occupations: Clerical and Services Related	2690	2535	-154	9.8	8.5
Total	27546	29673	2127	100.0	100.0

Source: Wilson (2001a) Table 4.2, Page 33.

3.15 Finally, we can provide an insight into the changing pattern of occupations at the more detailed skill level of 81 occupational groups (the so called 3 digit groups of the 'SOC 2000' classification). Such an examination should prove particularly useful to those planning education and training provision; to providers of education and training; and to those providing careers information and advice.

3.16 Table 3.3 sets out for each of the 81 occupational groups the estimated levels of employment in 1999, projections for 2010 and the changes in employment for the period 1999-2010, all ranked by the projected rate of change over the period. Also presented, in bold for comparative purposes, are the projections at the 'sub major', two digit, level of occupations. The annual rates of change vary from very high rates of growth like the 4.9 per cent per annum for leisure and travel service occupations to the extremely rapid decline of – 6.2 per cent per annum for housekeeping occupations. The average figure for all occupations is an increase of 0.7 per cent per annum, so we can see that the expected patterns of change are very diverse. Occupational groups experiencing very rapid growth (more than 3% per annum) are likely to include: caring and personal services occupations; healthcare and related personal service; business and statistical professionals; leisure and travel service occupations; ICT professionals; and childcare and related personal services. Relatively large occupational groups experiencing rapid decline (more than 2% per annum) include cleansing service elementary occupations; and plant and machine operatives.

3.17 These figures also show that there are wide variations in growth prospects within many of the 25 sub-major occupational groups. Amongst managers, for example, while Health and Social Services managers are projected to see growth of over 2.0 per cent per annum, Managers and Proprietors in the agriculture and service industries are expected to see a decline in job opportunities.

3.18 For the professions, some of the fastest increases are expected for Legal and Business and Statistical professions. ICT and Health professionals are also projected to have growth rates well above average. In the associate professional categories Design, Media, Artistic and Literary and Sports and Fitness categories are all projected to grow by 2.0 per cent per annum or more. This is in marked contrast to the Draughtspersons and Building Inspectors group which are expected to lose jobs at $2^{1}/_{2}$ per cent per annum.

3.19 Most of the clerical and secretarial occupations are expected to experience well below average employment growth. Healthcare and Childcare occupations are projected to grow by 3-4 per cent per annum, but Housekeeping occupations are projected to see a further decline. Most blue collar occupations are generally expected to see further job losses. Metal Working trades and Textile and Garment trades are expected to fare least well amongst the more skilled groups. Skilled craft jobs in metal forming, metal machining, electronics and vehicle assembly are all projected to decline. The prospects for Plant and Machine Operatives are also poor but more jobs are expected for Transport Drivers and Operatives. For the least skilled groups, further substantial job losses are expected for Elementary Agricultural Trades and Cleansing Service Operatives but some growth is anticipated for Elementary Security and Safety Services.

Table 3.3: Occupational Projections by SOC 2000 '3 Digit' Categories, Ranked by Growth

		1999	2010	Change 1999-2010	
				000s	% p.a.
Declining by 2 per cent per annum 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	Draughtspersons 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 per cent per annum					
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
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 per cent per annum					
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**

Table 3.3: Detailed Occupational Projections by SOC 2000 3 Digit Categories, Ranked by Growth (continued)

		1999	2010	Change 1999-2010	
				000s	% p.a.
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
Growing by between 0.1 and 0.9 per cent per annum					
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 per cent per annum					
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
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

Table 3.3: Detailed Occupational Projections by SOC 2000 3 Digit Categories, Ranked by Growth (continued)

		1999	2010	Change 1999-2010	
				000s	% p.a.
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 per cent per annum					
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**
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 per cent per annum 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.

Replacement Demand

3.20 In addition to the growth in new jobs (and loss of old jobs) it is necessary to 'replace' the skills that will be 'lost' as part of the normal process of labour turnover. The scale of such replacement demand can be very considerable

3.21 So far, we have focused only on the overall number of people we may expect to be employed in various occupations in the future: the increases and decreases in different occupations. However, such changes take no account of the additional, ongoing need to constantly replace existing workers who change jobs or retire, for example. So even when 'net joblosses' are forecast for the future this does not **necessarily** imply that the total number of job opportunities/vacancies available to people will actually decline. Employers will still need to replace, at least some of, those workers who leave due to retirement, career moves, mortality or other reasons. Indeed this 'replacement demand' may be quantitatively more significant than any 'expansion demand' which results from net growth in employment in an occupational group or it may outweigh negative employment changes resulting from projected employment decline. These occupational requirements are not new, net additional skill requirements but nonetheless skills need to be available to replace the skills 'lost' through this process of labour mobility and turnover.

3.22 If we add this replacement demand to what we might call the expansion demand we have discussed above, we obtain a figure for the overall requirements for each occupation. This provides an estimate of the number of appropriately qualified entrants likely to be required for each occupational group. This analysis is set out for each of the 25 occupational subgroups over the period 1999 to 2010, in Table 3.4 and Figure 3.3. In every occupational group, the overall requirement for workers is, in fact, positive. Replacement demand outweighs the net decline in jobs (i.e. the negative expansion demand) in a number of occupations and for all occupations taken together, replacement demand is more than five times larger than expansion demand. Over the decade as a whole there is expected to be an overall requirement of some 13_ million new job openings with retirements from the workforce being the main 'cause' of this figure.

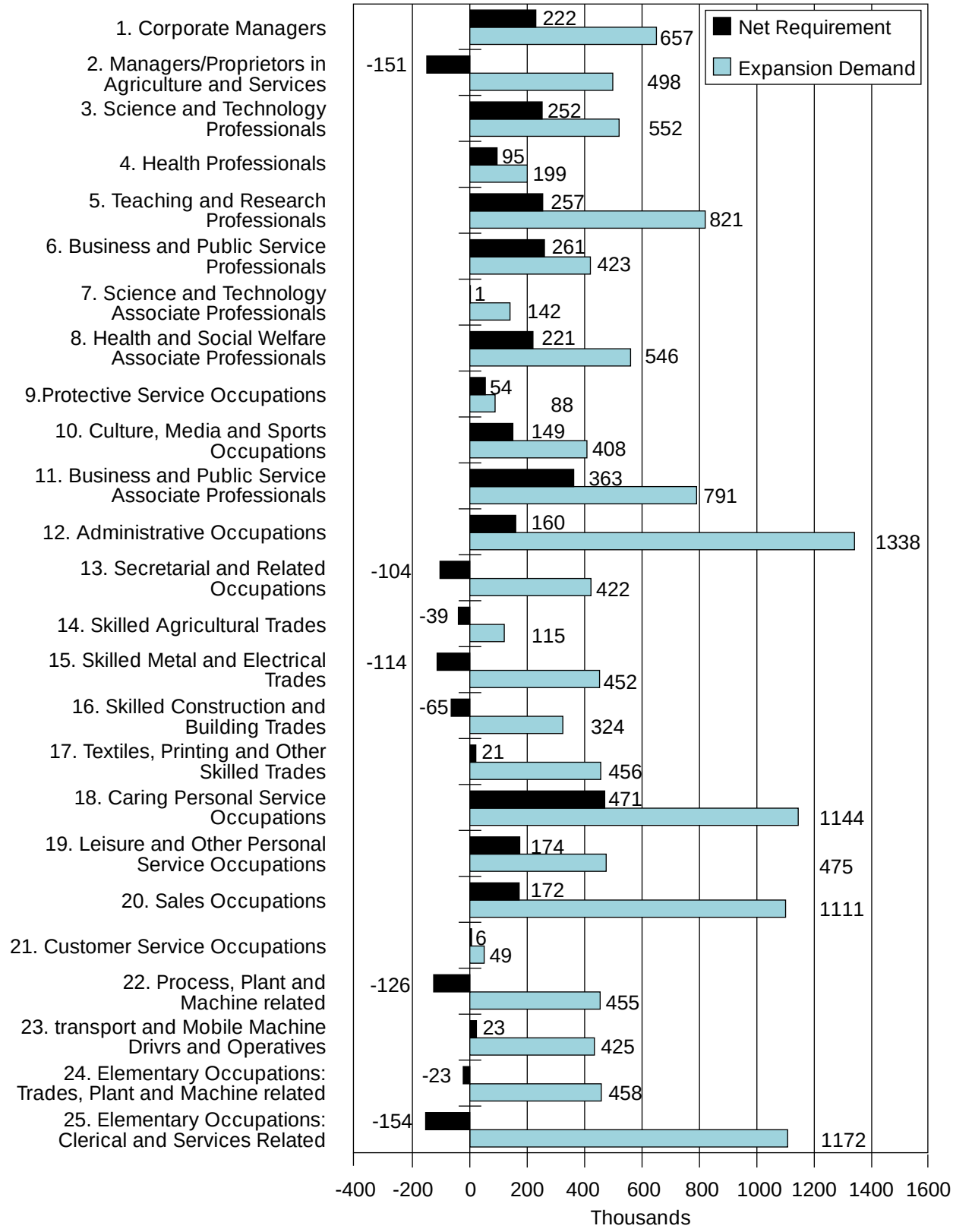
3.23 In a number of occupations, for example managers and proprietors in agriculture and service industries; secretarial and related occupations; skilled metal and electrical trades; and plant and machine related workers, a large net decline in jobs is expected to be more than outweighed by replacement demand. In other occupations, such as corporate managers; science and technology professionals; teaching and research professionals; health associate professionals, business and public service associate professionals; and sales occupations, expected retirements will add to positive expansion demand to create even higher overall requirements for new entrants to the occupations.

Table 3.4: Replacement Demand by SOC Sub-Major Group, 1999-2010 ('000)

	(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.

Figure 3.3: Net Requirements and Expansion Demand by SOC 2000 Sub-major Group, 1999-2010



Source: Wilson (2001a), Figure 4.8, Page 40

Changes in Qualifications

3.24 Overall, jobs are growing in 'qualification rich' occupations and declining in qualification poor occupations, driving up the overall levels of qualifications in the labour market.

3.25 The future demand for qualifications depends on a combination of the changes that take place in the occupational structure and any changes in the proportion of people employed in these occupations who require particular qualifications. Historical data on qualifications by occupation are only currently available using the SOC 1990 classification, so the prospects for occupations are presented here on that basis. Expected developments in occupations and qualifications held are combined here into a measure of the 'demand for qualifications'. It should be noted, however, that there may be a difference between the qualifications held by those undertaking a job and the qualifications actually required to undertake the job effectively. Our measure here of changing qualification needs is of the qualifications likely to be actually held.

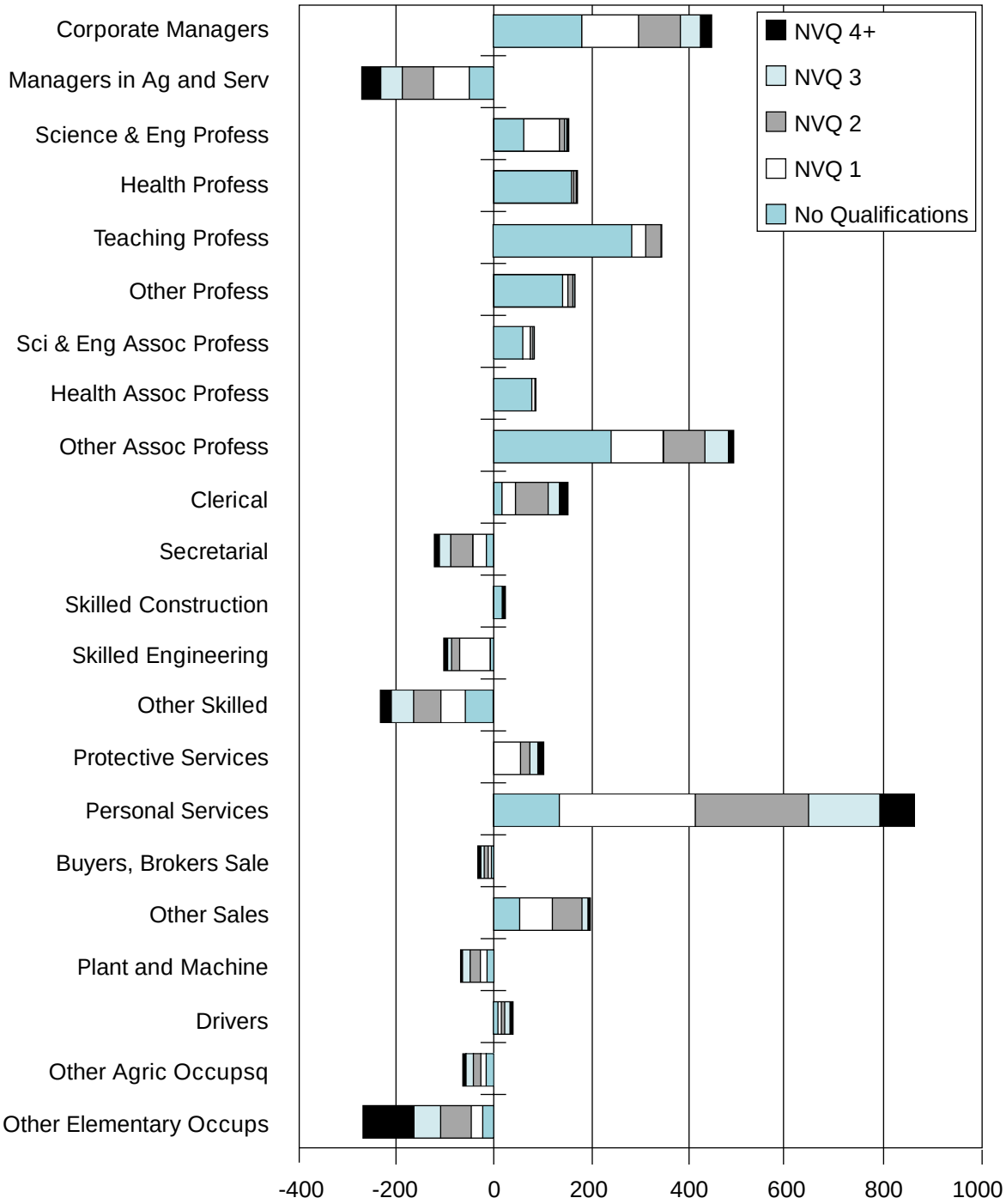
3.26 The rapid growth in the numbers employed in several occupational groups where the qualification levels are relatively high (eg. Corporate managers; professionals; and associate professionals in particular) combined with the decline in several occupational groups (e.g. secretarial and 'related' occupations; 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. Table 3.5 and Figure 3.4 below set out the impact of projected occupational change based on the assumption of 'fixed' qualifications rate i.e. where the proportion qualified to the various levels in each occupation remains at 1999 levels.

Table 3.5: Projected Change in demand for qualifications in GB, 1999-2010

Occupation	Change in demand for those qualified to					
	Employment change 1999-2010* ('000s)	NVQ4+ ('000s)	NVQ3 ('000s)	NVQ2 ('000s)	NVQ1 ('000s)	No qualifs. ('000s)
Corporate managers	437	186	110	85	37	19
Managers in agriculture and services	-271	-49	-80	-64	-37	-40
Science/Engineering professionals	149	106	28	8	5	1
Health Professionals	91	82	1	1	7	0
Teaching professionals	166	154	5	3	4	0
Other professionals	340	266	34	24	14	2
Science/Engineering assoc. professionals	60	30	18	7	3	1
Health assoc. Professionals	59	50	4	3	2	0
Other assoc. Professionals	509	232	123	93	45	16
Clerical occupations	147	21	34	56	21	15
Secretarial occupations	-113	-12	-22	-49	-22	-8
Skilled construction trades	22	1	10	3	3	5
Skilled engineering trades	-87	-11	-51	-12	-8	-6
Other skilled trades	-231	-61	-56	-53	-34	-28
Protective service occups	94	5	44	15	15	16
Personal service occups	858	115	294	253	133	63
Buyers, brokers/sales reps	-20	-2	-4	-6	-4	-3
Other sales occups	196	50	54	62	17	13
Industrial plant/ machine operators	-64	-2	-15	-14	-16	-17
Drivers/mobile machine operators	35	1	8	6	15	5
Other farming occups	-47	-3	-10	-11	-10	-13
Other elementary occups	-247	-7	-33	-56	-61	-91
Total	2082	1151	494	354	131	-48
As a % of New Jobs	100%	55%	24%	17%	6%	-2%
% of current workforce qualified to each NVQ level	-	26%	24%	23%	15%	12%

Source: Policy Research Institute calculations based on IER Forecasts 1999-2010, and Labour Force Survey, Spring 1999

Figure 3.4: Change in the demand for qualifications by occupation 1999-2010 in Great Britain



Source: Policy Research Institute calculations based on IER Forecasts 1999-2010, and Labour Force Survey, Spring 1999

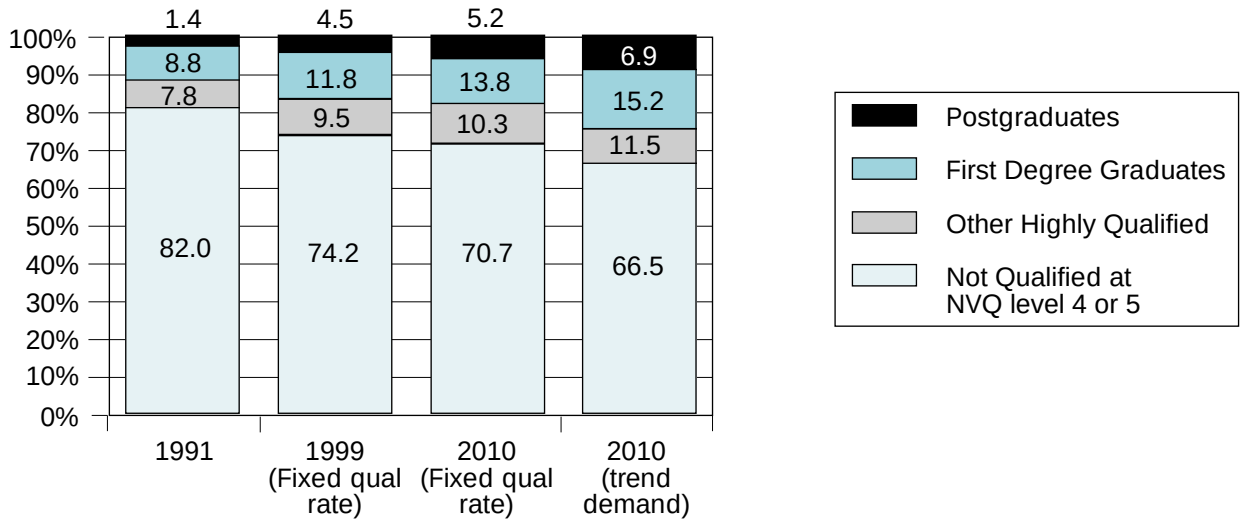
3.27 Overall it is likely that 55% (1,151,000) of the new jobs will be at NVQ level 4; 24% or 494,000 of the new jobs will be for those qualified to NVQ3; and 17% of the new jobs will be at level NVQ2 or equivalent. The demand for those without qualifications is likely to decline. Of course, the pattern of 'skill intensity' also varies considerably across occupations as can be seen in the table with, for example, the most rapid growth at NVQ level 4 or equivalent being amongst 'other' professionals, 'other' associate professionals and amongst teaching professionals. At NVQ level 3 or equivalent the growth is greatest amongst personal service occupations and 'other' associate professionals.

3.28 This rising 'skill intensity of jobs growth' assumes that there is no increase in skill needs within occupations, as proxied by employer's pattern of recruitment by qualification. If we were, instead, to extrapolate the **trend** in the proportions of people qualified, but at the rates of change observed in the 1990s, the structure of demand towards those with higher levels of qualifications would be much greater still. For example, the fixed graduate qualification rate amongst corporate managers is 34.5% - the trend rate (based on the growth of graduates in the occupation experienced in the 1990s), by 2010 would be 44.6%; for 'other' associate professionals the respective ratios are 29.4% and 35.3% (see Wilson 2001a). Our 'qualification' intensity estimates are thus at the conservative end of likely developments.

3.29 The growth in demand for those with higher level qualifications based on a fixed qualfications rate can be compared with those based on a trend demand scenario – i.e. where the proportion qualified are extrapolated at the rates of change which occurred in the 1990s (see figure 3.5). Even on the modest assumption of a fixed qualifications rate, the total number of those employed with qualifications above 'A' level or equivalent is expected to rise by around 1.5 million in the decade to 2010 – the vast majority of which are expected to be first degree graduates. One major influence on the numbers of young people entering higher education is the size of the 'population at risk'. Whilst the number of 21 year olds have **declined** in recent years (from 1985 to 1998 by about one third), their numbers are likely to stabilise or even grow a little over the next few years. Thus even a stable age participation rate will lead to increased numbers obtaining first degrees (assuming no increase in drop out/failure rates).

3.30 By 2010, on the basis of a fixed qualification rate assumption, nearly 30% of those in employment are expected to be qualified to NVQ level 4/5 or equivalent. If however graduate penetration rates (see Wilson 2001 a, Table 5.5, page 69) grow in line with 1990s trends, the number of jobs held by highly qualified people will grow more rapidly – by almost 2.75 million. This would lead to just about one third of those employed being qualified to NVQ4/5 or equivalent by the end of the decade.

Figure 3.5 Distribution of Employment by Highest Level Qualification, (%) Great Britain



Source: Wilson (2001a), Table 5.6, Page 70.

Trends in Skill Requirements

3.31 Our examination of trends in occupations and qualifications provides valuable insights into the changing skill needs of the economy. However, these need to be augmented by a consideration of generic skills such as communication, IT, numeracy, team working, problem solving, reasoning and work process skills and how the demand for these skills is changing. The need for these skills runs across occupational boundaries and qualification requirements. So, this section of the chapter assesses how the demand for such skills may change over the next decade.

3.32 Overall, a range of such skills are likely to become increasingly important – verbal skills, numerical skills, planning skills and communication skills.

3.33 The work of Ashton et al (1999) provides information on the actual skills used in jobs, based on the self reporting of skill proficiencies (see also chapter 2). A range of **generic skills** (some 36 in total) were investigated and respondents assessed how important each activity was in their present job, on a scale of 1 to 5. These were then combined and reduced to 8: verbal, manual, problem solving, numerical, planning and 3 aspects of communication skills: client, horizontal (colleagues) and professional.

3.34 Table 3.7 sets out the projections for the likely future demand for these 8 generic skills based on the assumption of a continuing rate of change of those skills as occurred between 1992-97. The data is based on a set of 'scores' where positive scores refer to a 'high' importance given to the skill, and negative scores to a 'low' importance. It is apparent that a range of skills are expected to increase in importance – most notably verbal skills, numerical skills, planning skills and all 3 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 3.6: Changing Generic Skill Requirements 1999-2010

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 differes from that in the original sample).

	Verbal		Manual		Problem Solving		Numerical		Planning		Client Communication		Horizontal Communication		Professional Communication	
Major Occupation Groups (SOC 1990)	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**	**1999**	**2010**
1. 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
2. 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
3. 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
4. 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
5. 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
6. 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
7. 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
8. 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
9. 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.

3.35 The research by Ashton et al, also enables a consideration of work skill changes in relation to: (a) autonomy (reflecting closeness of supervision and the extent of choice over job tasks) (b) required qualifications (reflecting the level of qualifications someone would need 'today' to get the type of job an individual already held) (c) training time (reflecting the amount of training, since starting the type work they do, that had undertaken) (d) learning time (reflecting how long it took workers to learn how to do the job well) and (e) a composite index of the above.

3.36 The main overall projected changes in work skills, as estimated in Wilson (2001), relate to an increase in training time, with large increases too, in required qualifications. The increase in learning time is smaller and there is essentially no change in relation to automony. The main changes in work skills that are expected to be required in relation to particular occupations are set out below:

- Autonomy – this is significantly increasing amongst craft and related occupations but declining significantly amongst both professional and sales occupations
- Learning Time – this is increasing significantly amongst associate professional and craft occupations
- Training Time – this is likely to increase very substantially amongst professional and personal service occupations, with increases too in clerical and craft occupations
- Required Qualifications – this is likely to increase most amongst personal and protective service occupations but also amongst professional, associate professional and craft occupations
- Composite Index – this is set to increase most amongst managerial, professional, associate professional, craft and personal services occupations.

Regional Variations in Future Skill Needs

3.37 So far we have examined future skill needs at the national level. However, regional variations in the level and pattern of economic growth, variations in economic and occupational structures as well as in current qualification levels, may well mean that there will be significant regional differences in future skill trends. So, in this part of the chapter we set out the main contours of projected occupational and qualification trends.

3.38 In general, it is clear that there are very great regional variations in future skills needs. Jobs growth is likely to be most rapid in the Southern part of England, with a particularly strong demand for managers in South East and East regions; for professionals in London and the South East; and for associate professional/technical occupations in the South East, South West and East. In terms of qualifications the increases, in relation to level 3, are likely to be greatest in the East and South East.

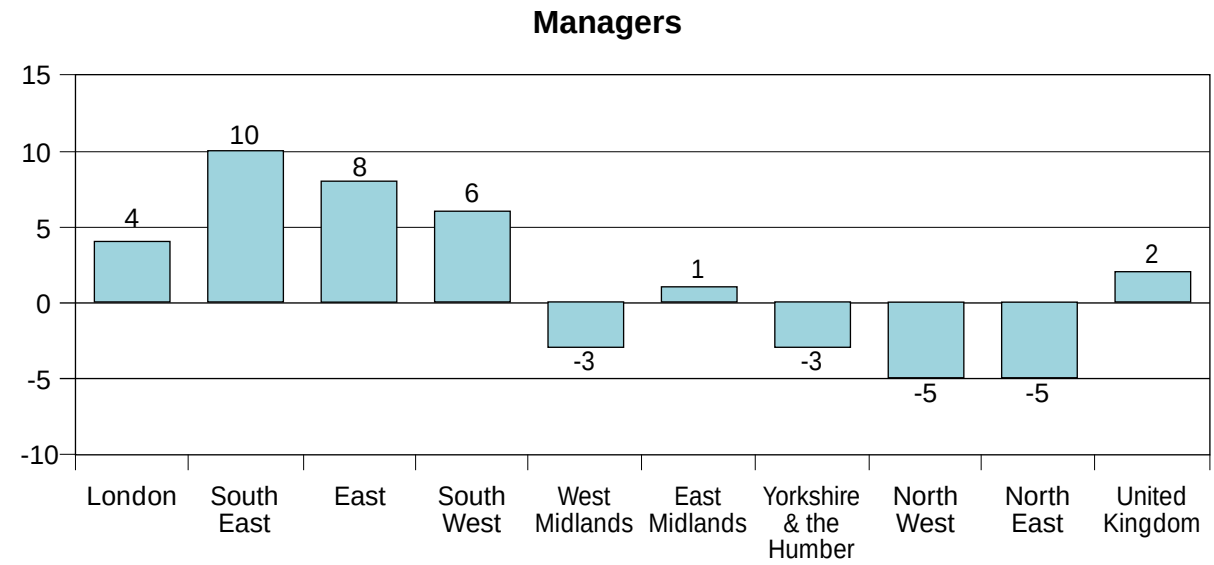
3.39 There are substantial differences across the regions in terms of both recent and expected economic growth and employment growth. Economic growth has been, in the period 1995-9, above the UK average in the South East, East, and South West regions. A similar pattern is expected to be replicated in the coming decade. In terms of jobs growth the 1995-9 period was one of very rapid employment growth in London, the South East and East (2.6%, 2.7% and 1.8% per annum respectively, compared to a national growth of 1.4%) with the slowest growth being in Yorkshire and the Humber and the North East.

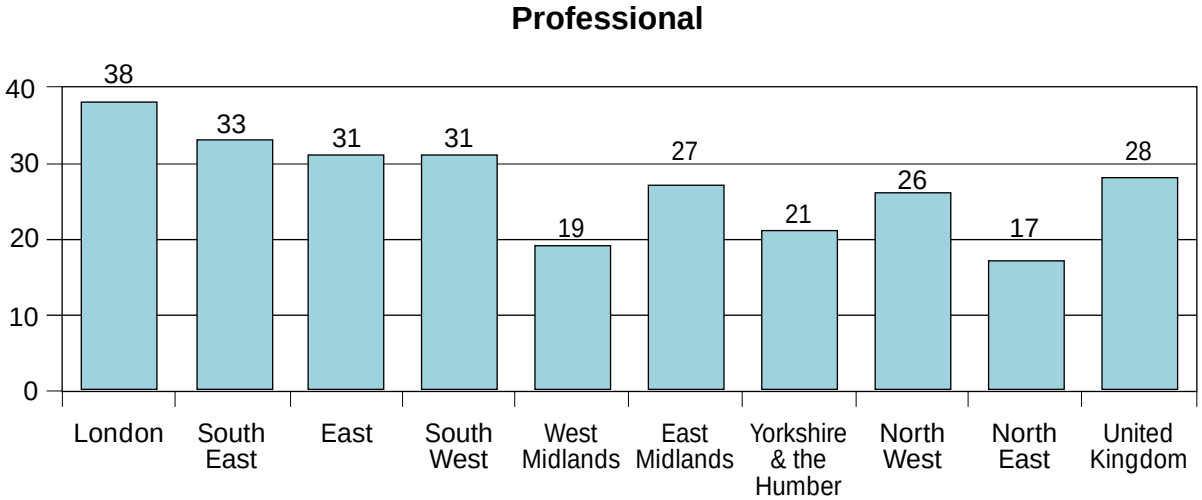
3.40 Over the period to 2010, the South East, East and South West regions are expected to record the fastest jobs growth with the West Midlands, Yorkshire and the Humber, North West and the North East all experiencing jobs growth rates below the national average. Indeed the 4 regions of the South East, South West, London and the East are expected to account for 70% of the expected additional 1,978,000 increase in employment in England over the period.

Occupational Prospects

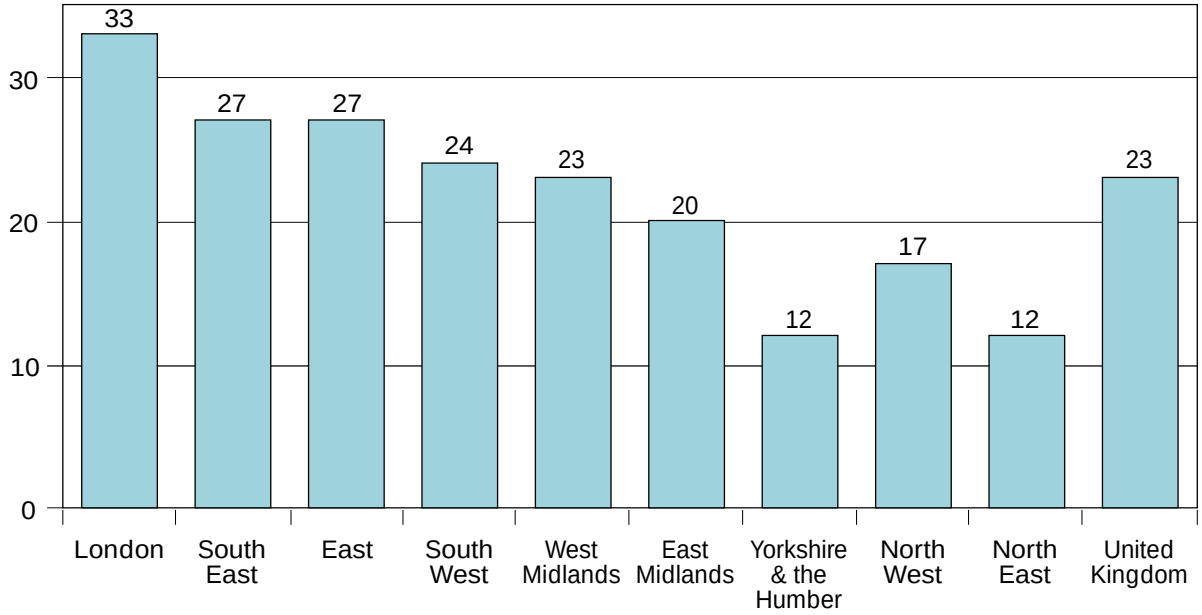
3.41 At the broad level of the 9 SOC major groups we can see that there are substantial differences in occupational prospects across the regions over the coming decade (see figure 3.6).

Figure 3.6: Projected % change in employment by occupations and region, 1999-2010

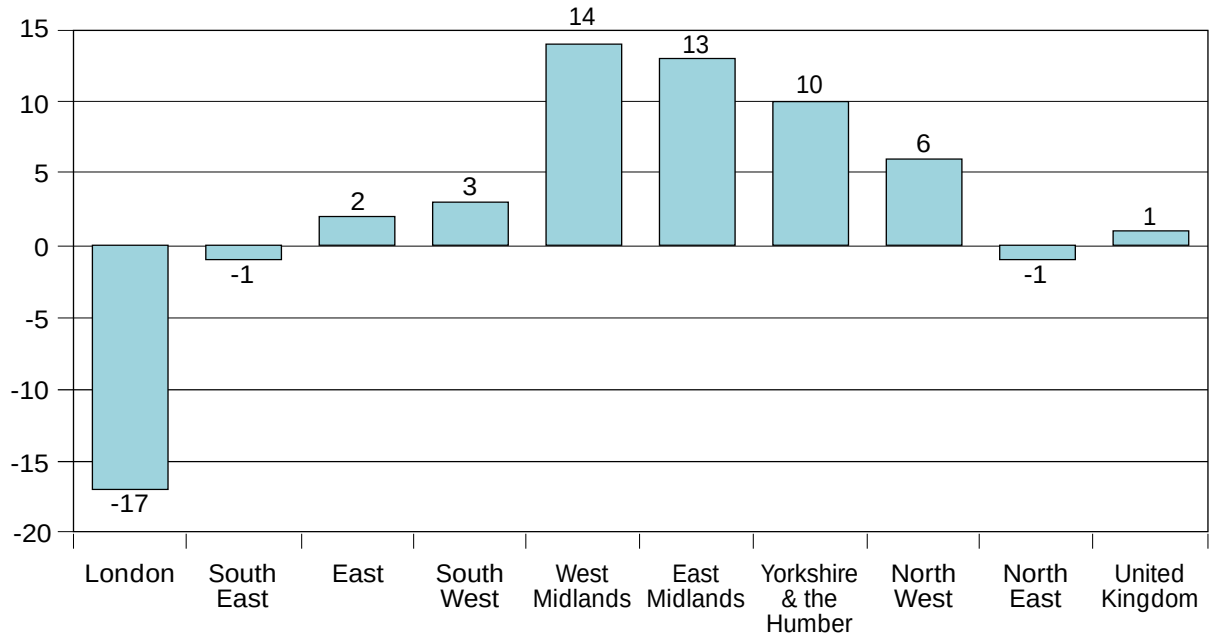




Associate Professional and Technical

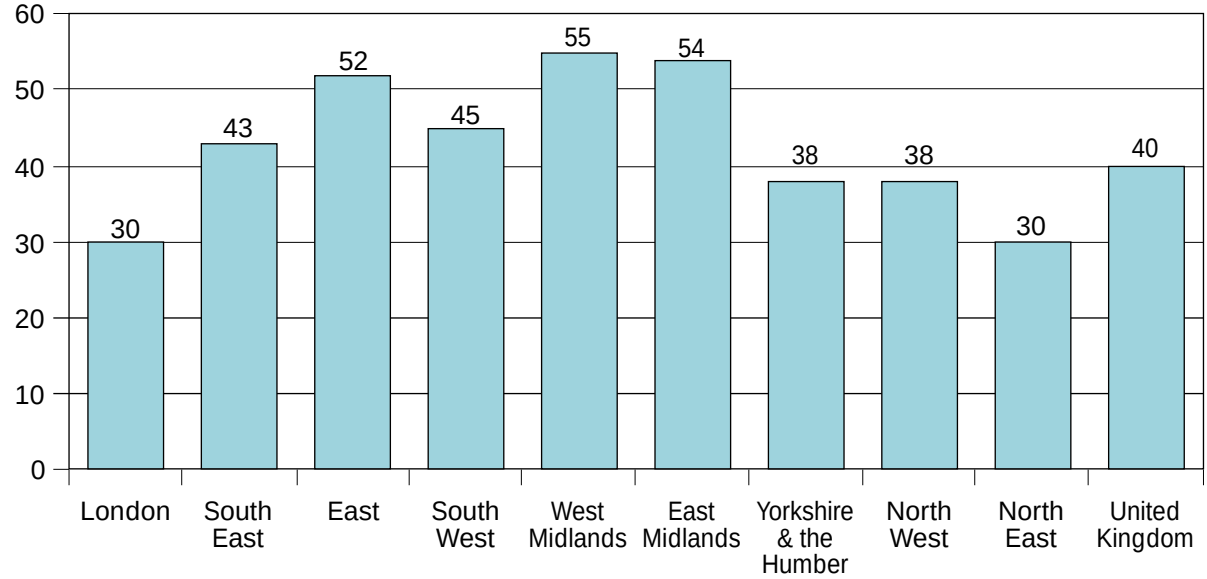


Administrative, Clerical and Secretarial



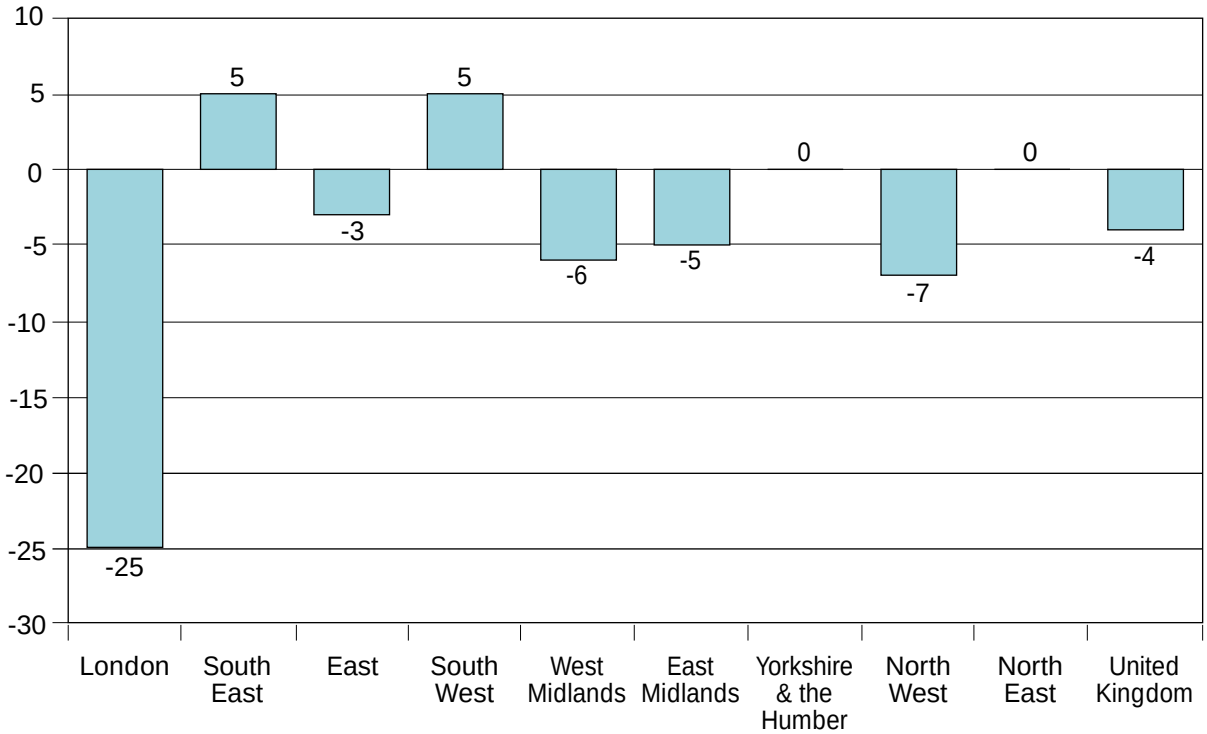
Skilled Trades

Personal Service

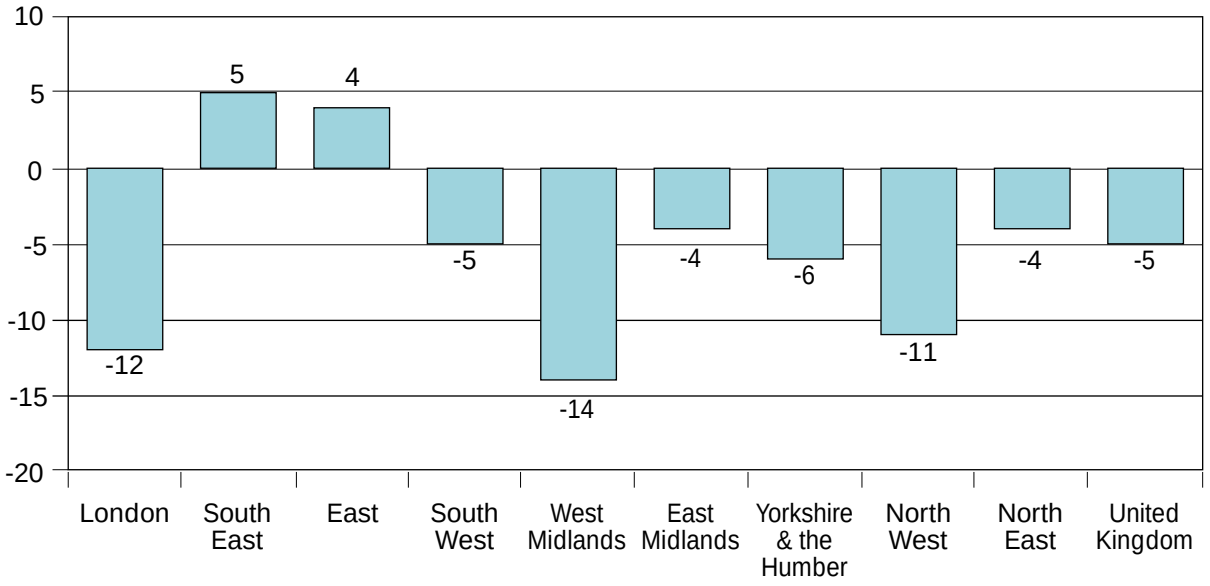


Sales and Customer Service

Process, Plant and Machine Operatives



Elementary



All

3.42 The strongest growths overall are in the professional, associate professional/technical and personal services occupations. The growth in professional and associate professional/technical is especially marked in the South (London, South East, East and South West regions) with the North East and Yorkshire and the Humber especially losing out.

3.43 Managers account for around 13 per cent of total employment in the UK, but for over 15 per cent in both London and the South East. The Eastern region and the South East also have shares of managerial employment in excess of the UK average. This 'over-representation' of Managers is projected to become even more pronounced with the largest growth being in the South East and East regions, and there being further significant growth in the South West and London. The East Midlands is the only other region where an increase in employment is projected over the decade. Elsewhere, job losses are projected, particularly in the North West and the North East.

3.44 The share of employment in Professional occupations is projected to increase across all regions over the period to 2010. London and the South East are likely to experience the fastest employment gains (of 38% and 33% respectively), with expected increases of nearly 215,000 and around 155,000 jobs, respectively. The North East is expected to have the lowest rate of employment increase across the English regions. This, nontheless, represents an increase of nearly one fifth in professional occupations over the decade.

3.45 Associate professional & technical occupations are currently over-represented in London and the South East relative to their UK average share of total employment. The fastest rate of employment growth is expected in London, with rapid rates of projected employment growth in the South East, the Eastern region and the South West. In the North East and Yorkshire and the Humber employment is projected to grow at little more than half the rate for the UK as a whole.

3.46 Administrative, clerical & secretarial occupations account for a larger share of total employment in London and the South East than in other parts of England. However, the regional pattern of projected employment change is markedly different from that for the occupational groups outlined above. In both London (where decline of 17% is expected) and the South East, employment loss is projected the period. The West Midlands, on the other hand, is expected to experience the largest increase in employment, with a projected gain of nearly 50,000 jobs or 14% over the period to 2010.

3.47 Projected employment increases in skilled trades are confined to the South East and the South West, otherwise all regions are expected to experience overall job losses. East Midlands is projected to witness the largest employment losses, with a reduction of 35,000 jobs, or 13%.

3.48 The proportion of people employed in personal service occupations in all regions is expected to expand very significantly over the period. The West Midlands, East Midlands and the East are expected to see the fastest rates of employment growth of over 50%. The growth rates are slowest in the North East and London.

3.49 All regions are projected to experience employment growth in sales and customer service occupations. The South West records the fastest projected growth rate (17%), with the Eastern region, the East Midlands and the West Midlands all, with expected growth of 14% over the period. London and the South East are both expected to experience a slower rate of growth than the national average.

3.50 Job lossess are projected nationally for process, plant and machine operatives. this group. However job gains, albeit relatively small, are expected in both the South East and the South West. However, in all regions the long-term trend is for Process, plant & machine operatives to account for a diminishing share of total employment. London is expected to see by far the largest reduction in employment, a loss of over 50,000 jobs, representing a decline of a quarter in the level of employment.

3.51 Employment in Elementary occupations is expected to decline nationally over the period to 2010. Over 80 per cent of the projected job losses are concentrated in London, the West Midlands and the North West, where annual average rates of job loss of over 1 per cent are expected.

3.52 This examination of broad occupational trends has provided an insight into the major regional trends. However, we can obtain a finer grained assessment of changes in different occupations across the regions by conducting a brief review of projected changes at the level of 25 occupational groups (see table 3.8). Nationally it is anticipated that a growth of 20% or more is expected in 10 of these occupational groups. However, regional variations in these projected changes are substantial and, by way of commentary, we examine the main regional variations in the top 5 rapidly growing occupations.

Table 3.7: Projected employment change, 1999-2010 by occupational sub-major group

Occupational Group	London				South East				Eastern				South West				West Midlands				UK
Occupational Group	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.	29	25	-4	-14.9	42	34	-8	-18.0	37	34	-3	-6.8	-11.7
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 3.7 (continued): Projected employment change, 1999-2010 by occupational sub-major group

	East Midlands				Yroks & the Humber				North West				North East				UK
Occupational Group	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
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 & OtherSkilled 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 '000

3.53 The fastest 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 and West Midlands with the slowest increases being in the North East (33%) and London (37%).

3.54 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 Eastern (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%).

3.55 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 Eastern region (40%). The slowest increases are expected in the North West (27%) and the North East (18%).

3.56 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 Eastern 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%).

3.57 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%).

3.58 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 one per cent of total employment nationally.

3.59 There are also considerable regional variations in the patterns of declining occupations. The group which 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%).

3.60 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%).

3.61 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.

3.62 There is a wide range of very substantial variations in regional patterns of growth and decline in employment across a wide range of occupations. These major variations have profound 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.

Regional Variations in Qualification Trends

3.63 What are the implications of these changes in the occupational structure for the level and structure of qualifications that will be demanded across the different regions? There are very considerable differences in the pattern of employment growth across the various qualification levels (see table 3.9) and therefore in the likely balance of qualifications that will be needed. In relation to NVQ level 5 or equivalent (higher degree) qualifications, the growth in employment at this level in the UK as a whole is expected to be around 31% or 381,000 over the decade. However, across the English regions this varies from highs of 37% in London and 34% in the East and South East to just 20% in the West Midlands and 21% in the North East and Yorkshire and the Humber. 47% of all employment at this level in England, is concentrated in just 2 regions – London and the South East, a proportion of which will rise still further over the next 10 years.

Table 3.8 Projected employment by qualification, 1999-2010

	Level 5		Level 4		Level 3		Level 2		Level 1		No qualifications	
Region	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	62.1	844	10.9	405	-17.8
East	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	40.5	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

3.64 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.

3.65 In contrast, for those with NVQ level 3 or equivalent as their highest qualification, 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%. 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 increases are expected in the East (5%) and South West (4%) in particular.

3.66 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.

Key Findings

- The scale and nature of expected future skill needs, is such that meeting these evolving skills requirements will be a major challenge for government and public agencies as well as for individuals and employers. Continuing major changes in economic structure are expected to occur over the coming period with major shifts of employment out of the manufacturing and primary sectors and into business services, public services, distribution and other personal services. Considerable changes in the occupational structure are also to be expected. This is also likely to lead to a more feminised and part-time employment structure. These changes will lead to considerable changes in the composition of skill requirements in terms of the actual jobs that will be available, the qualifications needed to fill them and the actual skills deployed within the jobs.

- The occupational structure of employment is anticipated to lead to extensive growth in a number of occupations especially in professional; associate professional and technical; and personal service occupations. A more detailed assessment of occupational change suggests that the greatest growth is expected to be in caring personal services; business and public service associate professionals; teaching, research and science/technology professionals; and corporate managers. Together, growth in these occupations is likely to account for 85% of the expected net jobs growth in the economy over the next 10 years. On the other hand there is expected to be a decline in secretarial, and skilled metal and electrical trades, process, plant and machine operative and elementary occupations which are and clerical and service related.

- The expected patterns of change across occupations are very great indeed, especially when viewed at the more detailed occupational category levels. It will require substantial labour market adaptability and skills development amongst the workforce to enable them to adapt effectively to these new sets of labour market requirements. It will also require adaptability from employers in relation to the process of recruiting these new employees.

- ❑ However it will also be necessary to 'replace' the existing skills that will be 'lost' to different occupations and to retirements as part of the normal process of labour turnover. The scale of this replacement demand substantially outstrips the scale of expansion demand by a factor of more than five to one (around 11.4 million compared to 2.1 million). Moreover the volume and pattern of such changes in replacement demand greatly varies across occupations and sectors and is, moreover, in composition, different to the sectoral and occupational structure of the expansion demand. It is essential for employers, providers and public agencies to recognise the different characteristics and requirements of these two different components of future skill needs.

- ❑ A small number of occupations experience high levels of both expansion and replacement demand - most notably business and public service associate professionals; caring and personal service occupations; and teaching and research professionals. Employers recruiting these occupational groups face a particularly strong challenge, therefore, in working with providers and engaging in training and recruitment activities to ensure that the appropriate levels of skill supply are available to meet these substantial requirements.

- ❑ Overall, jobs are growing in 'qualifications rich' occupations and declining in 'qualifications poor' occupations. Thus changes in the occupational structure alone is driving up skill demands. Even assuming a fixed qualification rate in occupations it is likely that 55% of new additional jobs will be at NVQ level 4 or equivalent, and above. Indeed it is expected (at a minimum) that 29% of all jobs in the economy by 2010 will be at NVQ level 4 or 5 or equivalent - an increase of over 1.5 million jobs from 1999. This 'qualification intensity' varies across occupations with particularly large increases in qualifications held at this level amongst corporate managers; other professionals; and other associate professionals. It will require a substantial effort both to ensure the requisite numbers of people become qualified to this higher level and, an even greater effort, to ensure that the structure of qualifications is appropriate to the evolving occupational requirements.

- ❑ In addition to an understanding of how the occupational and qualification dimensions of changes in skill levels are likely to develop, it is necessary to consider the likely changes in 'generic' skill requirements, skills that 'run across' occupational boundaries and qualification requirements. A range of such skills are expected to continue to increase in importance - most notably 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). It will be of considerable importance to both individuals and employers to seek to ensure that education and training developments encompass the fostering and development of the necessary skills appropriate to the current or expected occupations of the relevant learning participants.

- ❑ A range of 'key' skills are also expected to grow in importance - problem solving skills, team working skills and computing skills. Again, requirements are increasing more significantly in some occupations than in others and it will be necessary to try to ensure that training and education courses and programmes seek to develop these skills, especially reflecting particular needs of the occupation or sector concerned.

- A series of 'work skill' changes are also coming about - changes in autonomy (closeness of supervision) and training and learning time needed to obtain and effectively discharge a job. Again all these are shown to be likely to increase, though at different rates in different occupations. These too have implications for the type of work skills most likely to be required in the future.

- There are very substantial regional variations in the pattern of expected future skill needs both in terms of changes in occupations and qualifications. It will be necessary to address the specific and particular evolving skill needs in each region by seeking to ensure that the volume and structure of skills supply is appropriate to the changing labour market requirements. This will involve significant variations in the development of education and training provision in different regions.

- The significant regional variations in skill requirements will also, in and of themselves, need to be addressed on two counts. First, to enhance the economic and employment prospects of the region by raising skill levels in an appropriate manner. Second, in order to help raise the national 'average' performance. It will be extremely difficult to secure national targets and the skill enhancements that are desirable without a substantial and sustained improvement in the skills performance of relatively ‘skill poor’ regions.

- Regional jobs growth is expected to be fastest in the South East, South West and East regions. Particularly strong growth is expected in the demand for managers in the South East and East; for professionals in London and the South East; for associate professional and technical occupations in the South East, East 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; and for sales and customer service occupations in the South West.

- The detailed projections at the level of the 25 occupational groups provided in this chapter should be of assistance to public agencies, regional bodies and providers in helping to attune their strategies, policies and provision to evolving regional requirements. It should also be remembered however that skills to fill 'replacement' demand requirements will be often as important as those necessary to fulfill ‘new’ demands from the labour market though such estimates are not currently available at the regional level.

- 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 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.

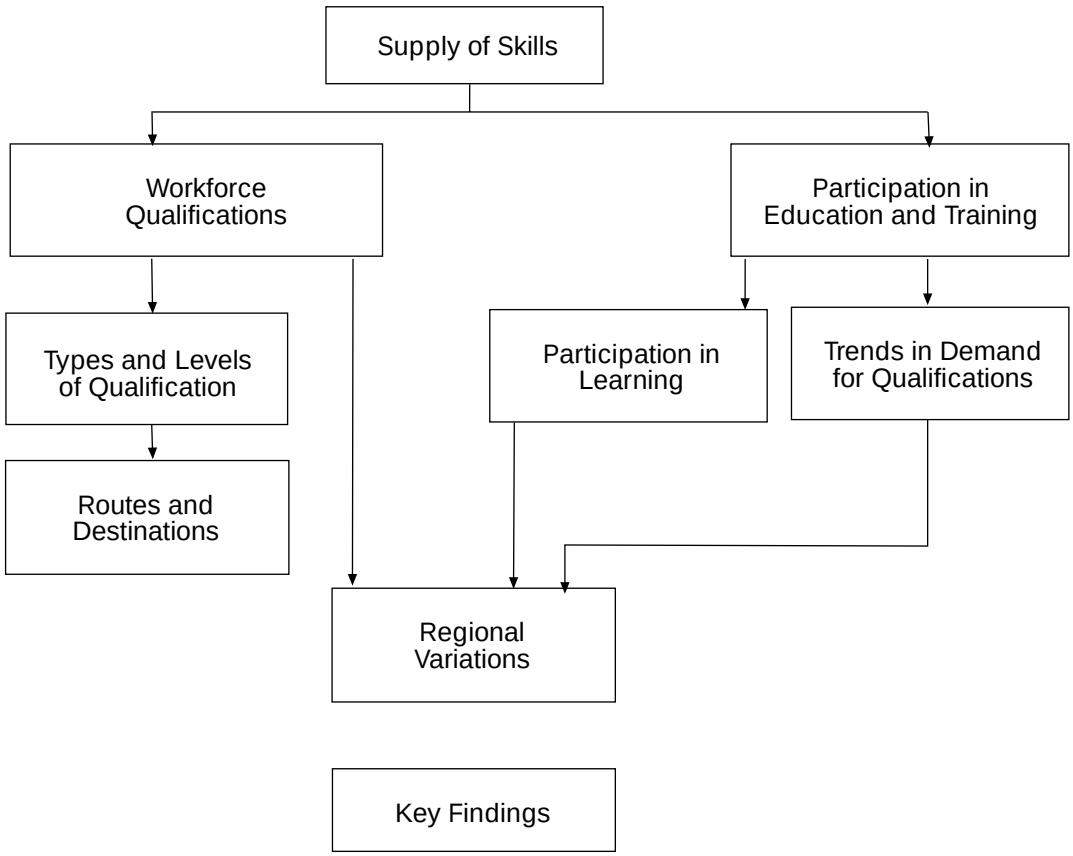
- It will require careful analysis and planning, as well as the development of appropriate strategies, policies and actions to seek to ensure a smooth transition in each region over the decade from a workforce with relatively low qualifications levels to another which is significantly higher qualified.

Chapter 4

The Supply of Skills

This chapter assesses the availability of skills. What is the current stock of skills and how is it changing? The chapter first examines the qualifications of the workforce as a whole. It then looks at how workforce qualifications differ across various groups in the workforce: employment status, age, gender, ethnicity and occupation. The chapter then proceeds to examine the different types and levels of qualifications including a discussion of academic and vocational qualifications. This is followed by a discussion of the routes through which these qualifications are achieved and the destinations of those who achieve them. We then go on to examine participation in learning and the barriers to it. Next we consider workplace training as a key means by which participation can be enhanced and skills improved. Finally we turn to the 'geography' of skills through an examination of regional and sub-regional variations by (LSC area) in skills levels, both in terms of qualifications and workplace training.

The structure of the chapter is set out in the orientation chart below.



Workforce qualifications

4.1 The Learning and Skills Council's objective is to seek to raise attainment and participation so that, by 2010, young people and adults in England will have knowledge and productive skills matching the best in the world. The key objectives which it seeks to achieve in order to realise these ambitions together with the interim targets they have set in relation to each objective for 2004, are set out opposite:

Table 4.1 Learning and Skills Council Objectives and Targets

Key Objectives	Targets for 2004
• Extend participation in education, learning and training	- 80% of 16 – 18 year olds in structured learning - Adult target to be set in 2002 Corporate Plan
• Increase engagement of employers in workforce development	- Develop measure in 2002 Corporate Plan
• Raise achievement of young people	- 85% at level 2 by age 19 - 55% at level 3 by age 19
• Raise achievement of adults	- Raise literacy and numeracy skills of 750,000 adults - Adult target at level 2 to be set in 2002 Corporate Plan - 52% of adults at level 3
• Raise quality of education and training and user satisfaction	- Targets to be set in 2002 Corporate Plan

Source : Learning and Skills Council (2001)

4.2 This section of the report examines the qualifications of the workforce in England as a whole focusing first on young people and then adults. Participation issues are discussed later in the chapter.

4.3 Currently 75% of **young people** reach NVQ level 2 or equivalent by age 19. There has been significant progress in recent years with regard to the proportion of young people qualified to this level, with the proportion of such 19 year olds increasing from 63% in 1993. This is in large part due to the increase in the proportion of young people obtaining 5 higher grade (A*-C) GCSEs. In 2000, 49.2% of 16 year olds obtained such a qualification compared to 43.5% in 1995. It is interesting to note however that 55% of girls achieved this level of attainment compared to 44% of boys. Moreover, while levels of attainment have increased for all ethnic groups, wide gaps in attainment remain with especially low attainment amongst Black, Pakistani and Bangladeshi students (Owen et al 2000).

4.4 Currently 51% of young people reach NVQ level 3 or equivalent at age 19. There has been significant progress over recent years with the proportion of such 19 year olds increasing from 35% in 1993. This is in part due to the increasing proportion attaining 'A' level qualifications as well as the increasing proportion achieving vocational qualifications at NVQ level 3 (see the sections on types and levels of qualifications and routes and destinations below, and dfes.gov.uk/statistics/DB/SBU/60265, table 3).

4.5 In terms of adult attainment at level 2 is concerned, currently 74% of the economically active adult population (70% of the whole adult population of working age) are qualified to NVQ level 2 or above. 51% of the economically active adult population (47% of the whole adult population of a working age) are qualified to NVQ level 3 or above. There has been considerable progress in relation to the latter in particular, over recent years, with an increase from 36% to 51% of economically active adults qualified to this level since 1993. At NVQ level 4 or equivalent the proportion of economically active adults who are qualified to this level has increased from 22% to 27%.

4.6 Overall then, the qualifications held by the workforce as a whole have increased substantially over the last 20 years, whilst for example, in 1979 more than 40% of the economically active population did not hold any qualifications, by 2000 this figure has fallen to just under 12%. Similarly, just about a quarter of the workforce was qualified to NVQ level 3 or its equivalent, or about in 1979, compared to the current figure of 51% of the economically active. This reflects two trends. First those who have remained in the labour market over this period are more highly qualified than those who left the labour market over the period.

Basic Skills

4.7 As far as attainment amongst adults is concerned, raising the literacy and numeracy skills of 750,000 adults is an important challenge. Overall, it is estimated that approximately one in five adults (19%) has less literacy than is expected of an 11 year old (below NVQ level 1) (Moser 1999 Table 2.1, page 17). Problems relating to numeracy are thought to be even more severe: approximately half (48%) of all adults have numeracy problems (again, skills below those expected of an 11 year old), with 23% classed as having 'very low' numeracy (Moser, 1999; Table 2.4 page 18; 1999 Bynner and Parsons 1997).

4.8 The Moser report indicates that there are an estimated seven million adults who are functionally illiterate or innumerate, but that only 250,000 are taking part in relevant study to overcome these problems. The target set by Moser is that by 2010 there should be a reduction, by half, in the number of functionally illiterate adults of working age. This equates to 450,000 people per annum from 2002, passing the threshold for literacy and numeracy, compared to a current rate of 70,000 per annum.

4.9 The extent to which individuals recognise and acknowledge literacy and numercy problems is potentially one of the key barriers to improvement. Only 5% of adults indicate that they have problems with reading and a similar proportion that they have difficulties with numbers, compared to the estimated 20% with low or very low literacy and 40% with low or very low numeracy.

4.10 Moreover, around 500,000 people whose first language is not English, have little command of the English language. The issue is particularly prevalent amongst Punjabi and Bengali speakers. One in four of those whose first language is not English obtained a 'zero score' in the test, meaning that they could not fill in their name and address (reported in Moser 1999, page 19).

4.11 The International Adult Literacy Survey, (OECD and Statistics Canada 2000) identifies three different domains of literacy: prose (understanding information from texts eg newspapers, instruction manuals); document (using information from various formats including timetables, maps, tables and charts); and quantitative (applying arithmetic operations to numbers embedded in printed materials). This last domain we refer to here as numeracy. Some results for UK skill levels are shown in Table 4.3 (see also chapter 5). In relation to each of the domains, at least half of individuals were found to have skills below IALS level 3, the level identified by the OECD as 'a suitable minimum for coping with the demands of everyday working life in a complex advanced society'. The population at level 1 in the UK is the third lowest of the 12 countries for which this information is provided. (see 5.118ff for more details of this survey)

Table 4.2: % of adults with poor literacy and numeracy skills, UK

	Level 1 skills (very poor) %	Level 2 skills (weak) %	Total levels 1 and 2 %
Prose	22	30	52
Document	23	27	50
Quantitative	23	28	51

Source: Coleman and Keep (2001)

4.12 As with other skills (as proxied by qualification levels), there are significant disparities within the population in the extent to which individuals are disadvantaged in relation to basic skills development. The Adult Literacy in Britain Survey (1997), indicates that the following groups are amongst the most likely to have the lowest level of basic skills (see also Bynner and Parsons 1997; Moser 1999):

- Older people (aged over 45);
- Those with low levels of educational attainment;
- The unemployed and economically inactive;
- Manual social classes;
- Those with a low income;
- Those from non-white ethnic groups (Institute for Employment Research, 2000).

4.13 Similarly, the OECD concludes the following in relation to the development of basic skills:

- Formal education is the main determinant of literacy proficiency in most countries including the UK;
- There is a significant correlation between the literacy scores of individuals and their parents' length of education;
- Age and occupation are major determinants of basic skills.

Inequalities in Workforce Qualifications

4.14 Despite these considerable improvements, there remain 26% of the economically active population who have either no qualifications or qualifications below level 2, (see table 4.3). This re-confirms concerns over the 'major adult skills gaps' identified as one of the Skills Priorities in the NSTF Research report (National Skills Taskforce 2000a).

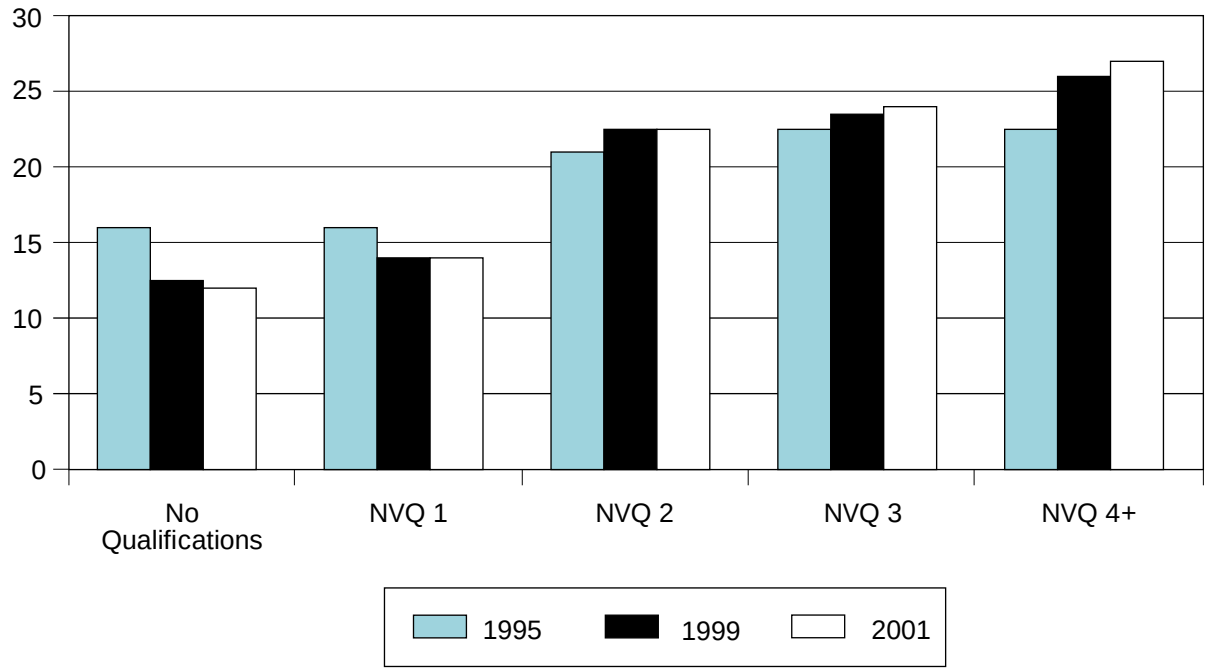
4.15 The significant expansion of Higher Education has resulted in an increase in the

supply of graduates into the labour market (hence the increase in the proportion of the economically active qualified to NVQ or equivalent level 4, and above). However, some concern has been expressed (Mason, 2001) that this increase is at the expense of individuals who, previously, would have undertaken specific employment-related intermediate level training. In particular, the ratio of graduate employees to those with higher intermediate qualifications has increased from 1.38 in 1988 to 1.56 in 1998 (ibid). Reflecting this change, more employers are now recruiting graduates to positions that, in the past, have been filled at technician level.

4.16 Mason suggests that these changes are partly as a result of changing demand (i.e. the need for a higher standard of performance and / or a higher level of skill or knowledge). However, he also acknowledges that there are concerns amongst employers about the 'lack of appropriate work experience' and 'lack of commercial understanding / awareness' amongst graduate applicants, '*reflecting a continuing demand by employers for the skills and knowledge most easily acquired through employment based intermediate skills training*' (p 21).

4.17 Modern Apprenticeships are one route via which the supply of such intermediate work-based skills can be increased. In addition, the development of Foundation Degrees (to start in 2001-2002) is also partly aimed at tackling this issue; the new qualifications being '*designed to supply highly-qualified graduates to address the shortage of people with intermediate level skills in a wide variety of professional areas determined by employers demand*' (HEFCE, 10 July 2000). The courses will combine both academic and workplace learning.

Figure 4.1: Highest NVQ Equivalent Qualification Held by Economically Active Population, England, 1995-2001 %



Source: Labour Force Survey, 1995, 1999, 2001

4.18 The distribution of qualifications across different groups in the workforce varies considerably (see Table 4.2). Inequalities in educational attainment are apparent in

relation to a number of variables including economic status, age, gender and occupation. The following groups are amongst the least likely to hold any formal qualifications:

- ILO unemployed (22% without qualifications)
- Economically inactive (31% without qualifications)
- Individuals aged over 50 (21% without qualifications)
- Individuals employed in manual occupations (up to 23% without qualifications)

Table 4.3: Qualifications of the workforce: Highest NVQ Equivalent Qualification, England, 2000-01

	No qualification	NVQ 1	NVQ 2	NVQ 3	NVQ 4+
Economic status					
Economically active	11.7	14.3	22.8	24.5	26.8
In employment	11.1	14.0	22.6	24.7	27.4
ILO unemployed	21.8	19.0	25.5	19.8	13.9
Economically inactive	30.7	15.8	21.2	20.7	11.6
Age[1]					
16-24	8.3	10.3	37.7	29.3	14.5
25-49	8.8	13.9	22.7	23.8	30.8
50+	21.1	17.9	13.6	23.4	24.0
Gender[1]					
Male	10.9	14.1	18.1	29.9	26.9
Female	12.6	14.5	28.6	17.7	26.6
Ethnicity[1]					
White	11.7	13.5	23.3	25.0	26.4
Non-white	11.6	24.4	15.6	17.4	31.1
Occupation[1]					
Managers and administrators	6.9	9.6	20.2	26.2	37.0
Professional	0.6	3.8	4.1	8.7	82.8
Associate professional and technical	1.8	7.1	14.2	20.4	56.6
Clerical and secretarial	8.5	15.2	38.5	23.0	14.8
Craft and related	13.5	12.7	15.8	50.8	7.2
Personal and protective service	12.7	18.9	29.7	27.8	10.9
Sales	14.3	14.8	36.2	23.0	11.6
Plant and machine operatives	22.6	30.0	20.2	22.9	4.3
Other	33.2	23.0	24.5	15.5	3.7

Source: Labour Force Survey, Dec 2000 - Feb 2001

[1] Percentages based on all economically active.

4.19 Inequalities in attainment by gender are most apparent at levels NVQ 2/3 and equivalent. Whilst the proportion of females without formal qualifications is only slightly above that for males, the proportion of females qualified to NVQ level 3 or equivalent is considerably below that for their male counterparts. The proportion of females qualified to NVQ 2 or equivalent, on the other hand, is considerably higher. Women are clearly under represented in education and training at level 3, experiencing only limited progression from level 2.

4.20 An analysis of educational attainment by broad ethnic group tends to mask the highly significant differences between ethnic groups if they are examined at a more disaggregated level. A separate consideration of all of the non-white groups shows that individuals from the Bangladeshi (24%), Pakistani (19%) and Black Caribbean (16%) ethnic groups are considerably more likely not to hold any qualifications than those of white (12%), Black African (8%) and Indian (10%) ethnicity. Only 28% of Bangladeshis and 39% of Pakistanis are qualified to NVQ level 3 or above, or its equivalent, compared to more than 50% of whites.

4.21 This is important not only in relation to issues of equal opportunity and social inclusion. Minority ethnic groups are a very rapidly growing component of the population, having grown by 21% between 1991-9 compared to an overall population growth of 1.2%. They are expected to account for more than half of the growth of the working age population over the next 10 years (Owen et al 2000). Moreover, this growth will affect some localities even more considerably eg London, Bradford, Leicester and a number of smaller towns in the North West. The growth is expected to be particularly strong amongst the Black and South Asian communities.

4.22 The disparities in educational attainment across occupational groups can also be seen to be considerable, presenting potentially significant barriers to individuals' prospects for occupational mobility. In addition, concerns expressed previously regarding the '*worryingly high proportion of managers and proprietors with either no qualifications or only qualifications below level 2'* (National Skills Task Force, 2000b) are borne out by current levels of attainment – 17% of managers are only qualified, if at all, to NVQ 1 or equivalent. This is significant not only because it indicates relatively low levels of managerial skills, but also because it is acknowledged that highly qualified managers can act as a catalyst to the uptake of education and training opportunities throughout the workforce.

Types and Levels of Qualifications

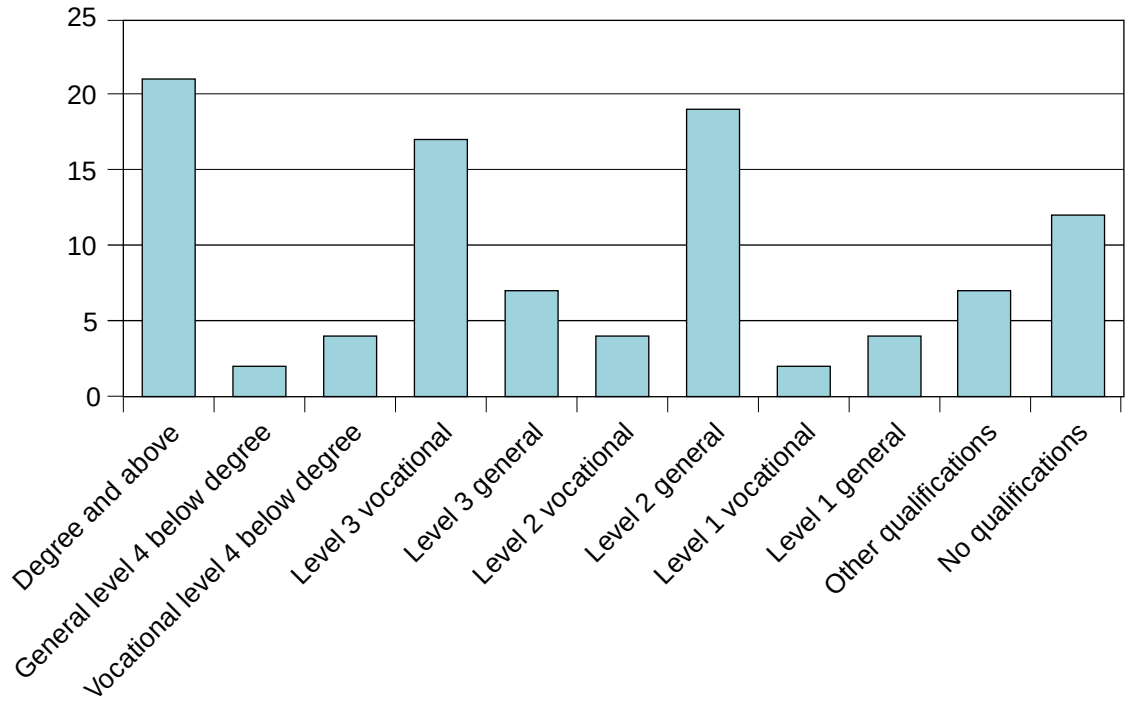
4.23 Whilst providing considerable insights into the skill levels of the workforce, qualifications are, of course, only a proxy for skill levels in the workforce. A focus solely on the highest level of qualification held by individuals can mask other factors relating to the development of relevant skills. In particular, it ignores the differential benefits to be gained from acquiring either vocational or general / academic qualifications. Despite the development and growth of vocational options in recent years, it remains the case that more than half of the economically active population hold general / academic qualifications[1] with only just over a quarter holding vocational qualifications. In

1 Academic or general qualifications: degrees, higher degrees, other degrees, diploma in Higher Education, Higher Education below degree, A level, AS level, O level/GCSE/CSE. Vocational qualifications: all other qualifications recorded by LFS. (National Skills Task Force, 2000a)

particular, whilst vocational qualifications are more common than general / academic qualifications at NVQ level 3 or equivalent, the reverse is the case amongst individuals holding a highest qualification at NVQ level 2 or equivalent and at NVQ level 4 or equivalent (see Figure 4.2). The lack of esteem associated with vocational qualifications is a potential barrier to achievement of the national skills targets, and the Skills Task Force has expressed concern that individuals with general rather than vocational qualifications may not have had sufficient opportunity to develop the skills needed in the labour market (DfEE, 1999a)

We examine these distinctions between academic and vocational qualifications here as well as levels of attainment in the different types of qualification.

Figure 4.2: Highest qualification of economically active people, by type of qualification, England, 2001 %



Source: Labour Force Survey, Spring 2001

Academic Qualifications

4.24 Academic qualifications achieved in post compulsory education largely fall into two categories: A levels and degrees; the former usually obtained through schools or Further Education (FE) Colleges at age 16-18, and the latter through participation in Higher Education (HE). It should be noted that data for the former relate to the number of entries rather than the number of individuals - many individuals enter for more than one A level.

4.25 Entries to A levels amongst 16-18 year olds in Great Britain have fallen slightly during the period 1995/96 – 1998/99 (see Table 4.4). However, this is more a result of demographic factors than an issue of falling rates of participation. Indeed, it has already been shown that an increasing proportion of young people are remaining in post compulsory education and it is also the case that an increasing proportion of those that

remain in education are achieving two or more A level passes (equivalent to NVQ level 3). In 1995/96, 30% of 16-18 year olds in education achieved two or more A levels. This increased to 34% by 1998/99.

4.26 Perhaps the most significant changes that are taking place in relation to A levels are the patterns of subject choice that are emerging. Since 1995/96, there have been significant reductions (in percentage terms) in entries to the traditional humanities and arts subjects (including languages), coupled with a decline, albeit less significant, in the entries to science subjects, including maths. The greatest increase is evident in relation to physical education (from a low baseline) and new vocational subjects including computer studies (up 38%) and design and technology (up 15%).

4.27 Concern has been expressed in particular about the decline in the numbers of those developing their mathematical ability through the study of both maths and physics A levels (as a foundation for further study in subjects such as engineering, electronics and other advanced technical disciplines). It should be noted, however, that, in absolute terms, entries to maths A levels still exceed those for all other subjects, with the exception of General Studies (see Table 4.4).

4.28 Reflecting the increases in the proportion of young people achieving level 3 qualifications (2 or more A levels) via this academic route, it is evident that a higher proportion of entrants are achieving a pass (grade A-E) in all subject areas than was the case three years ago.

Table 4.4: Entries and achievement in A levels amongst 16-18 year olds, Great Britain, 1995/96 – 1998/99 (GB)

Subject	No. entries 1995/96 (000s)	No. entries 1998/99 ('000s)	% change in no. of entries 1995/96–1998/99	% achieving grades A-E 1995/96	% achieving grades A-E 1998/99
Biological sciences	63.0	60.7	-3.6	84	88
Chemistry	50.8	48.5	-4.5	87	91
Physics	43.9	41.8	-4.8	75	89
Other science	9.5	10.6	+11.6	82	87
Mathematics	91.4	84.6	-7.4	85	88
Computer studies	15.2	20.9	+37.5	78	83
Design & technology	16.6	19.0	+14.5	87	89
Business studies	40.2	42.7	+6.2	82	88
Art & design	39.8	41.3	+3.8	91	94
Geography	49.9	47.2	-5.4	84	92
History	48.3	42.8	-11.4	85	89
Economics	25.4	20.6	-18.9	81	89
Social studies	78.1	62.8	-19.6	72	85
English	61.2	49.6	-18.9	86	89
English Literature	56.5	64.9	-14.9	92	94
Communication studies	24.6	28.1	-14.2	85	90
Modern languages	56.5	43.5	-23.0	89	93
Physical Education	13.6	19.5	+43.3	86	88
General Studies	67.2	85.2	+26.8	82	84
Total (including some subjects not specified)	903.6	875.6	-3.1	84	89

Source: DfEE, 2000

4.29 The expansion of HE that took place in the 1990s is evident when considering the number of first degree qualifications awarded in 1999/00, compared to those awarded in 1995/96. The number of first degrees awarded increased by almost 10,000, or 4.5%, over this time period (see Table 4.5).

4.30 The expansion of HE has, however, impacted differentially on different subject areas, with some of the most significant increases, in percentage terms, occurring in relatively new vocational subject areas including computer science, librarianship, art and design and business. There has, however, also been considerable growth in some of the more traditional academic subjects including medical related subjects and biology. There have been substantial reductions in education, architecture and, to an extent, in engineering and technology.

4.31 There remains a strong gender dimension to the subjects being studied. For example on full time degrees 75% of those studying subjects allied to medicine are women, 72% of those studying languages and 77% of those studying education. On the other hand 85% of those studying engineering and technology are men and 80% of those studying computer science (Equal Opportunities Commission 2001).

4.32 The relatively high level of entry to maths A levels, does convert to achievement at degree level in maths but not in engineering. Whilst the former has seen an increase in the number of first degrees awarded over the last four years, the latter has witnessed a decline.

Table 4.5: First degree obtained, by subject area, English Institutions, 1995/96 – 1999/00

Subject	Number obtaining first degree, 1995/96	Number obtaining first degree, 1999/00	% change 1995/96 – 1999/00
Medicine and dentistry	4,443	4,568	+2.8
Subjects allied to medicine	9,967	13,300	+33.4
Biological sciences	10,713	14,769	+37.0
Veterinary science	321	387	+20.6
Agriculture and related	1,631	1,789	+9.7
Physical sciences	11,406	10,838	-5.0
Mathematical sciences	3,335	3,500	+4.9
Computer science	7,858	9,656	+22.9
Engineering and technology	19,044	16,989	-10.8
Architecture, building and planning	6,694	4,964	-25.8
Social, economic and political studies	17,893	19,210	+7.4
Law	8,697	8,602	-1.1
Business and administration studies	22,626	25,369	+12.1
Librarianship and information science	2,324	3,785	+60.7
Languages	13,698	13,852	+1.1
Humanities	8,161	8,144	-0.2
Creative arts and design	14,739	18,702	+26.9
Education	12,209	9,682	-20.7
Combined	31,986	30,029	-6.1
Total	207,745	217,995	+4.9

Source: HESA

Vocational qualifications

A valuable summary of vocational qualifications in the UK is contained in DfES (2001).

4.33 Vocational qualifications cover a range of options that can be studied for and accredited either within formal education institutions (for example GNVQs), in the workplace (for example, NVQs) or through a combination of work based and college based study. For the purposes of this report, vocational qualifications have been divided into three groups – GNVQs, NVQs and 'other' vocational qualifications (VQs).Our analysis on the numbers of other VQs made in 1999/00, is based on awards made by City & Guilds, RSA and EdExcel and OCR which equate to around 91% of all qualifications awarded.

4.34 In total, just over 1 million vocational qualifications (of all types) were awarded in 1999/2000. This is an increase of 25% on the 861,000 vocational qualifications awarded in 1995/96. Almost half (47%) of the awards in 1990/00 were 'other' non-regulated vocational qualifications; 42% were NVQs; and 11% were GNVQs (see Table 4.6). Although GNVQs contribute the least, in volume terms, to the achievement of vocational awards, this is the area in which the most rapid increase in qualifications has taken place. The number of GNVQs achieved has increased by 72% compared to 1995/96. This increase partly relates to the more recent introduction of this type of qualification. We now consider GNVQs, NVQs and 'other' vocational qualifications in turn.

Table 4.6: Vocational qualifications awarded, UK, 1999/2000

	Total	GNVQs	NVQs	Other
Total qualifications awarded	1,073,000	117,000	454,000	502,000
% at level 1	32	11	14	53
% at level 2	40	47	58	23
% at level 3	23	42	25	17
% at level 4	5	-	3	8

Source: Vocational Qualifications in the UK 1999/2000: Statistical Bulletin, Issue 5, May 2001

4.35 Overall 117,000 GNVQs were awarded in 1999/00 including 47% at Intermediate level (NVQ2 equivalent) and 42% at Advanced level (NVQ3 equivalent). The dominance of the traditional academic route for young people remaining in education post 16 is demonstrated by the fact that in 1998/99 875,000 entries to A levels were made by young people aged 16-18, compared to just 41,000 entries for Advanced GNVQ qualifications amongst the same age group (although this partly reflects the entry to more than one A level by each individual).

4.36 The subject areas covered by individuals undertaking Advanced GNVQs is also considerably narrower than those for individuals entering for A levels. Of the 41,000 Advanced GNVQ entries, more than three quarters were in one of just four subject areas – business (36%), leisure and tourism (18%), health and social care (14% (predominantly studied by females)) and information technology (8% (predominantly studied by males)). Of those who entered Advanced GNVQs, 80% achieved at least a pass .

4.37 Since their introduction in 1987 just under 3.1 million NVQ awards have been made up to September 2000. Between 1991/92 – 1999/2000 the number of NVQs

awarded annually almost trebled, although it peaked at 446,000 in 1997/98 and has tailed off slightly in the subsequent two years. There have been some considerable changes at the level at which NVQs are awarded since their introduction. The majority of NVQs are awarded at level 2 (59%), with a significant minority (22%) at level 3. Currently some 946,000 people are working towards an NVQ.

4.38 The subjects in which the highest number of NVQs are awarded tend to be in the newer, service sector related areas (business (19% of all awards) and sales (14%) in particular), although a significant proportion are also achieved in IT (11%) and in some of the more traditional apprentice trained areas including manufacturing (8%), construction (8%) and engineering (6%) (QCA).

4.39 One of the key routes to achieving an NVQ is through the Foundation Modern Apprenticeship (FMA) and Advanced Modern Apprenticeship (AMA) programmes. In 1999-2000, approximately one third of all leavers from the FMA achieved a level 2 qualification (14,500 qualifications in total), with a slightly higher proportion of leavers from the AMA achieving a level 3 qualification (26,000). However, the majority of individuals leaving each of these programmes are not achieving the level of qualification for which the training is intended.

4.40 Again, the subjects / occupational areas in which trainees on these programmes are participating indicate a mix between service sector dominated study (particularly business administration, hospitality and customer service) and the more traditional apprentice-trained areas of construction and engineering manufacture (FMA and AMA Trainees Database). There is a strong gender dimension to this with, for example, 1% of AMA trainees in electrical engineering, plumbing, motor and construction being women compared to around 90% or more in travel, health/social care, hairdressing and childcare (Equal Opportunities Commission 2001). 77% of trainees in Information Technology are male.

4.41 'Other' vocational qualifications account for approximately half of all vocational qualification awards made in 1998/99. The majority of these are at level 1. There are, however, a significant proportion of these qualifications that are achieved at sub-degree level. These will provide some supply of individuals with relevant qualifications for intermediate / technician type employment, an area in which the potential for skills shortages, partly as a result of the expansion of Higher Education, has been highlighted above. Table 4.7 shows the growth in the number of registrations on HNC and HND courses since 1989/90. Overall, registrations on these courses have increased by 29% over the last decade. However, the increase is very considerably less than that which has taken place in relation to degree programmes. The vast bulk of the increase occurred in the early 1990s since when registrations have stabilized. Furthermore, registrations on part-time programmes (HNCs) have actually declined through the 1990s. Between 1995/96 – 1999/00 HE entrants increased by 7%, compared to a 0.5% increase in part-time registrations on HNC and HND courses.

4.42 An examination of changes in registration by subject areas provides some indication of the potential for a shortfall in supply to some technical disciplines. In particular, it should be noted that registrations on engineering and construction courses have fallen considerably. On the other hand registrations on IT courses have grown very considerably.

Table 4.7: Registrations by subject area on HNC and HND courses 1989/90 – 1999/00

	1989/90			1995/96			1999/00			% point change 1989/90-1999/2000		
	HNC	HND	Total	HNC	HND	Total	HNC	HND	Total	HNC	HND	Total
Total	33241	27550	60791	29399	48546	77945	31717	46610	78327			
% of total in each subject area:--												
Art & design	0.8	16.3	7.8	2.3	11.7	8.1	5.7	11.9	9.4	+5	-4	+2
Business & management	24.4	28.3	26.2	35.4	27.3	24.9	23.9	21.1	22.2	-1	-7	-4
Construction & built environment	20.0	6.6	13.9	10.2	5.4	6.0	10.1	3.6	6.2	-10	-3	-8
Engineering / technical & manufacturing	39.1	17.6	29.4	26.9	15.3	20.5	24.8	14.2	18.5	-14	-3	-11
Science / health / social care	8.8	6.6	7.8	8.1	8.5	9.7	9.7	9.2	9.4	+1	+3	+1
Hospitality / leisure	0.5	7.1	3.5	1.6	11.6	15.8	2.2	11.3	7.0	+2	+4	+4
Land & countryside	0.1	2.0	0.8	1.0	3.3	2.8	1.9	2.9	2.5	+2	+1	+2
Media communics.	0.0	0.0	0.0	0.4	4.2	3.5	1.2	5.7	3.9	+1	+6	+4
Sales	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0	0	0
IT	6.2	15.4	10.4	14.0	13.8	17.8	20.3	20.9	20.7	+14	+6	+10

Source: EdExcel

Comparison of Vocational and Academic Awards

4.43 At NVQ2 level, 56% of all awards in 1999/00 were vocational (ie intermediate GNVQ, NVQ or other VQ) with the remainder being GCSE awards - a proportion which has remained broadly constant since 1994/5. However nearly all of those who obtained a level 2 award at age 16 did so via the GCSE route whereas 99% of people who attain level 2 aged 17 and over do so by the vocational route (DfES 2001, Table 1).

4.44 At NVQ3, level 3 concern has been expressed about the extent to which achievement is dominated by the academic route of A level (NSTF 2000) rather than vocational options. However, in fact, in 1999/00 over half of all level 3 awards (53%) were vocational ie Advanced GNVQ, NVQ or other VQ - an increase of the 50% in 1995/6 (DfES 2001, Table 3). It is however the case that 79% of those also obtained a level 3 award aged up to 18 did so by the A level route whilst 89% of those who obtain a level 3 age 19 and over do so by the vocational route.

4.45 It is also important to note that the 'take up' of vocational qualifications is concentrated in certain occupational categories. For all three types of vocational qualification (GNVQ, NVQ and other VQ) the most prevalent occupational group is clerical and secretarial (DfES 2001, Table 5). For GNVQs, the occupation with the largest take up is, in addition to clerical/secretarial, associate professionals; for NVQs it is craft and related, and for other VQs it is associate professionals.

Routes and Destinations

4.46 Having examined the different types and levels of qualifications we now go on to consider the routes through which these qualifications are achieved and the destinations of those who achieve them.

Routes

4.47 The options for participation in learning are increasing in terms of location and methods of study (for example, the development of community based adult education and new opportunities for distance learning). However, there remain three key routes through which individuals participate in post compulsory education and training: Further Education, Higher Education and Government Supported Training. These are the chief means (together with training which is discussed below) through which the stock of skills is augmented, in particular in terms of qualifications.

4.48 Full-time participation in **Further Education** (FE) is dominated by young people aged 16-18. In 1998/99, 950,000 students were participating in full-time FE of whom 53% were aged 16-18. However, the numbers studying part-time in FE, at almost 2.5 million in the same year, are more than double that for those engaged in full-time study through this route. Of those studying part-time, just over 60% are aged over 30 and a further 20% are aged 22-30. Increasing opportunities for part-time study, providing greater options for participation amongst what may be termed ‘non-traditional’ learners, is one method by which the ‘widening’ (Kennedy, 1997) of participation in FE is being encouraged.

4.49 Opportunities for 'non-traditional' learners to study through part-time courses in FE are evident when considering the level at which participation in FE is undertaken by full-time and part-time students. Amongst full-time students (on courses lasting at least one year), only 9% of courses studied are at entry or level 1 compared to 37% of courses studied part-time. Approximately 30% of full-time courses are at level 2 (compared to 27% of part-time courses), with 54% of full-time courses at level 3 (13% of part-time courses).

4.50 One of the most significant contributory factors to the increase in attainment levels in the workforce is the expansion of **Higher Education** (HE) that has taken place since the late 1980s. Indeed, this, alongside the increase in post 16 staying on rates, is attributed with the significant increases which have occurred in the achievement of academic qualifications, whilst the growth in vocational qualifications, particularly those acquired in the workplace, has been small in comparison (Coleman and Keep 2001).

4.51 In 1989, approximately 1 in 6 young people entered HE. By 1994 this figure had increased to approximately 1 in 3. Participation rates have remained relatively stable since this time. In 1995/96 the numbers entering higher education in England to first degree courses were 287,700. In 1999/2000 this figure had increased to 296,400.

4.52 There are a variety of options available for employment-related learning opportunities through **Government Supported Training** (GST) and these have undergone a number of changes over the last decade. Currently, the Work Based Training for Young People options comprise: Advanced Modern Apprenticeships (AMA); Foundation Modern Apprenticeships (FMA, formerly National Traineeships); and 'other' work based training. Participation in these options (or previous permutations of them) has increased steadily over the last decade. In volume terms, 193,000 individuals were participating in some form of work based training for young people in March 1991, compared to 274,000 in March 2000, an increase of 42%. Despite these increases, GST is still felt to face something of an image problem amongst young people within schools, with indications that few 14-16 year olds would enter this as their preferred post 16 option. In addition, employers remain concerned that the best 16-18 year olds are encouraged to stay on at school rather than consider vocational options (Morris et al, 1999a).

4.53 Of those participating in GST in March 2000, almost half were undertaking an AMA, designed to provide education and training to NVQ level 3, with 25% engaged in an FMA, providing learning to NVQ level 2. Linkages between the two options, reinforced by the re-branding of National Traineeships to FMAs, are aimed at encouraging progression from the FMA to the AMA and, consequently, from level 2 to level 3. However, whilst this progression is felt to be seamless in some sectors (eg construction), in others there is a significant jump in terms of the levels of skills developed (eg IT), thus providing a barrier to the intended progression (Kodz et al, 2000).

4.54 The differing level of skills required for the two options is likely to be an important factor in determining the age of participants in the two programmes. Whereas almost half of those who started an AMA in 1999-2000 were aged over 18, this was the case for under one quarter of those starting an FMA during this time period (AMA and FMA Trainee Databases). Participation has also varied significantly by gender and ethnicity. Whilst there has been a significant under-representation of females engaging in these

options in the past, this appears to be changing with females now accounting for just under half of all starts on the AMA and just over half of all starts on the FMA. However, participation amongst non-white ethnic minority groups remains limited (Pathak, 2000).

Destinations

4.55 The destinations of those who participate in education and training provide a useful indicator of the extent to which their skill acquisition has been utilized and is of relevance to the demands of the labour market, or for providing a stepping-stone to further education and training. Destinations data should be treated with caution however as it provides only a short-term 'snap-shot' of outcomes rather than an indication of the longer-term benefits of education and training in terms of, for example, subsequent career development, the quality of jobs entered or the sustainability of subsequent employment. Here we briefly examine the destinations of participants from the three main routes through education and training that we considered above: FE, HE and GST.

4.56 Obtaining accurate data on destinations from FE is problematic, a situation exemplified by the fact that in 1997/98, the destinations of more than half of full-time students and three quarters of part-time students were classified as ‘unknown’ and, of course, many of these students are already in employment.

4.57 The extent to which courses in FE are used as a route into further study is demonstrated here by examining the outcomes only for those for whom destinations information is available. Of all those leaving full-time courses, 37% went on to further study in FE and 36% to HE. Only 27% went into employment. Clearly these outcomes will differ depending on the level of study - those who studied at level 1 or entry level (71%) and at level 2 (64%) predominantly progressed to further education, with the majority of those who studied at level 3 (52%) entering HE. Individuals who had studied at level 2 and level 4 were the most likely to enter employment. Destinations from part-time courses differed significantly from those arising from full-time study. Here, progression routes to further education and training are less common, with 57% entering employment and just 29% engaging on other courses in FE.

4.58 The latest available data from HESA (1999/2000) indicates that approximately 67% of those completing a first degree in **HE** enter employment (18% into temporary jobs). This is slightly higher than was the case in 1995/96 (66%). A further 19% of leavers enter further education or training, with just 5% 'seeking' employment or training i.e. being essentially unemployed.

4.59 In terms of the type of job obtained, the largest proportion of leavers from HE who move into employment enter professional (34%), associate professional (24%), managerial (16%) and clerical and secretarial (13%) occupations. These destinations and their relative importance have altered little over the last three years. The relatively high proportion entering associate professional occupations again provides an indication of the extent to which graduate penetration is taking place in jobs that may, in the past, have been taken by those with intermediate level skills and qualifications.

4.60 The destinations of young people leaving **GST** vary significantly depending on the type of training in which they have been involved. A high proportion of leavers from

the AMA enter employment (86%) and this has increased significantly since the early stages of the programme (67% entered employment in 1995/96). A further 5% achieve a 'positive outcome', which includes full-time education or a place on another training programme. Outcomes from 'other' work based training for young people are slightly less encouraging. Approximately 60% enter employment, with 73% achieving a 'positive outcome'.

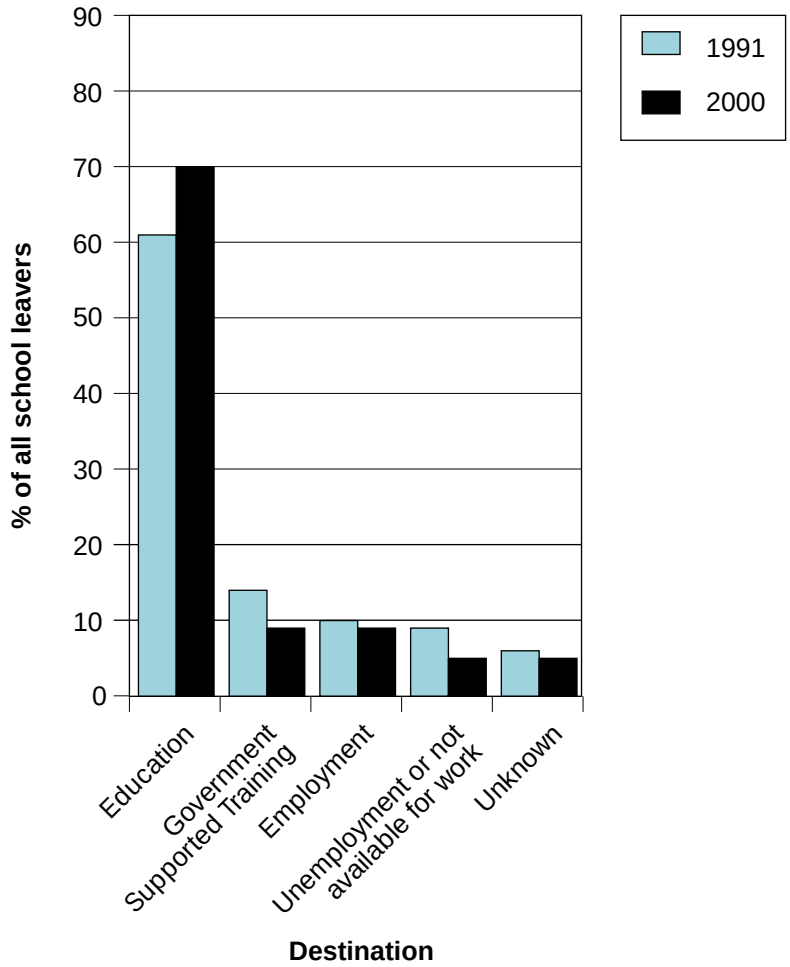
Participation in Learning

4.61 Increased participation in education and training is a pre-requisite to an increase in attainment and skill levels. However, it should be acknowledged that an increase in participation will not, in itself, necessarily result in a corresponding increase in measurable achievement, as a considerable proportion of learning that is undertaken is not accredited. Whilst potentially contributing to skills acquisition in the workforce, therefore, some increases in participation may make only a limited contribution to the acquisition of qualifications even if they increase skill levels more generally. Moreover, of course, increasing participation needs to be paralleled by the successful completion of learning episodes so that outcomes are raised alongside participation improvements. We examine, in turn, young peoples' participation and that of adults.

Young Peoples' Participation

4.62 Participation of young people in education and training is largely governed by their destinations after completion of their GCSEs: destinations at age 16 provide us with a good indication of participation in post compulsory education. Figure 4.3 shows the destinations of school leavers in England in 1991 and 1999. The proportion of school leavers remaining in education has increased by approximately 10 percentage points over this time period, whilst there have been decreases in the proportion of school leavers entering both Government Supported Training and employment, and in the proportion who are unemployed. This increase in 'staying on' rates, stimulated by a combination of factors including increasing levels of attainment pre-16 (largely following the replacement of O levels with GCSEs), increasing choice of education-related options post 16 and changing labour market conditions for young people, is one factor that has contributed to the increase in attainment levels across the workforce (Coleman and Keep, 2001).

Figure 4.3: Destinations of School Leavers, England, 1991 and 2000

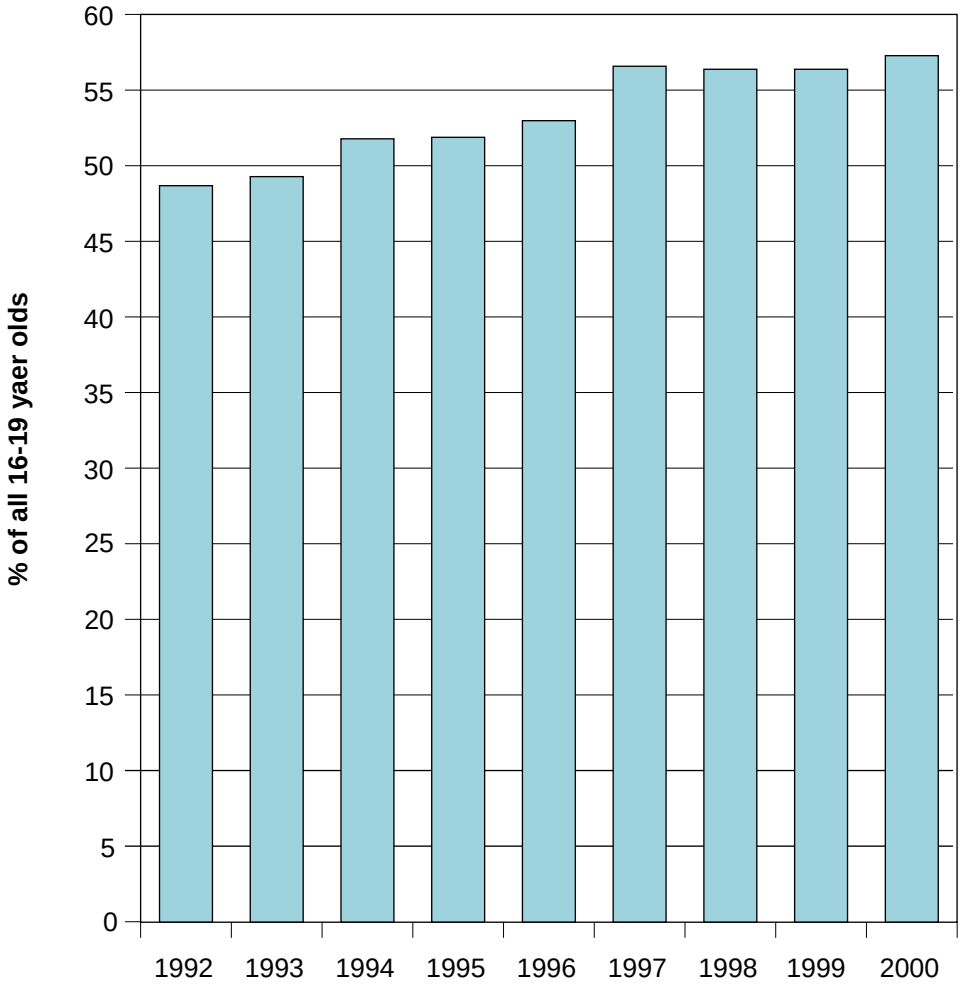


Source: DfES, (2001b)

4.63 The growth in the proportion of young people remaining in post-compulsory education is evident when considering the percentage of 16-19 year olds engaged in full-time education and training over the last decade (see Figure 4.4). In 1992, 49% of this age group were participating in full-time education. By 2000, this figure increases to 57%, representing an increase of 240,000 individuals (from 1,135,000 to 1,375,000) over this time period. It should be noted though that participation rates have not increased since 1997.

4.64 Moreover, young peoples' participation in full time education remains well below that of most other OECD countries (DfES 2000, table 7.5). The participation rate of 18 year olds in full time/part-time education (in programmes lasting a year or more) is 49%. This is a participation rate above only Turkey and Mexico and thus below that experienced in all other 25 OECD countries. It is, indeed, well below some of our main competitors including the USA (63%), Ireland (71%), the Netherlands (78%), Belgium (80%), Germany (86%) and Sweden (96%).

Figure 4.4: % of all 16-19 Year olds in Full-Time Education, England, 1992-2000



Source: Labour Force Survey

4.65 87% of 16 year olds and almost 80% of 17 year olds were in either full-time education, part time education or Government Supported Training at the end of 2000. The comparable figures for 1990 are 86% and 75%. 72% of 16 year olds in the year 2000 were in full time education (including 35% studying for A levels, 7% for advanced GNVQ and 5% for NVQ3 or equivalent vocational qualifications), 8% in Government Supported Training, 3% in employer funded training and 5% in other education and training. Around 36% of 16 year olds are studying full time in further education, 35% in schools and 7% are studying part time.

4.66 59% of 17 year olds were in education and training (including 35% studying for A levels, 8% for advanced GNVQ and 6% for NVQ3 or equivalent vocational qualifications). 11% in Government Supported Training, 5% in employer funded training and 6% in other education and training. (For further details see DfES, Statistical First Release, 29 June, 2001).

Adult Participation

4.67 Significant importance is attached to the need to increase participation in education and training amongst adults. Results from the 2001 National Adult Learning

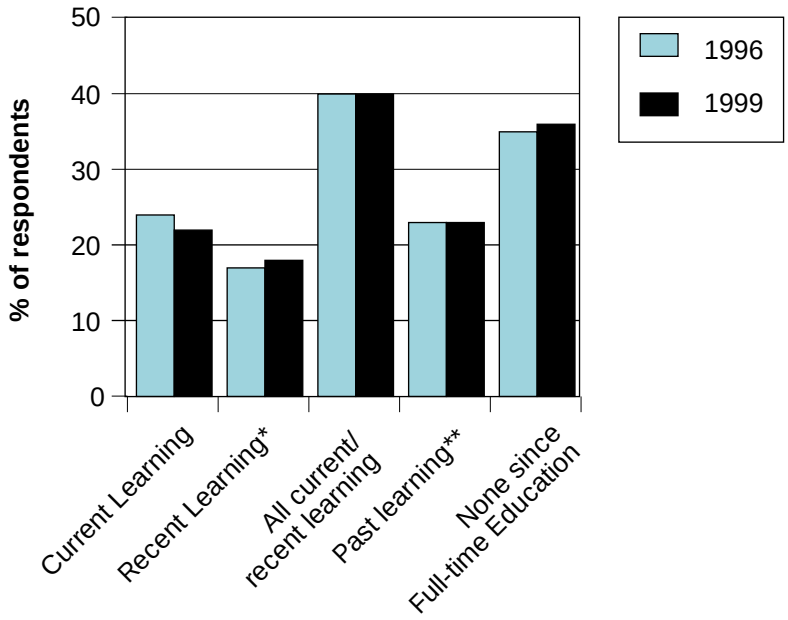
Survey (NALS) are awaited before an update from the 1998 figures (of 26% of adults not having undertaken any formal or informal learning within previous 3 years) can be assessed.

4.68 In addition to the NALS, a number of other sources of information are however available to provide useful data in relation to adult learning. Comparisons of the different data sources do, however, highlight some of the definitional issues associated with the term 'adult learning'.

4.69 Figure 4.5 shows the proportion of adults that have participated in learning in the UK, as measured by a survey carried out by NIACE, the national organisation for adult learning, in both 1996 and 1999 (Sargant, 2000). The survey, of more than 5,000 adults aged 17+, indicates that approximately 40% of adults have participated in learning at some point over the last three years. This compares to a figure of 76% recorded by NALS in 1998. The widely differing results are largely attributed to the broader definition of learning adopted by the NALS survey (Hillage et al, 2000).

4.70 Data from the NIACE survey indicates that levels of participation in learning have remained relatively constant since 1996. 40% of adults are either currently engaged in learning, or have undertaken learning over the last three years. However, there remain 37% of adults who have not participated since they completed their full-time education.

Figure 4.5: Participation in learning amongst adults, UK, 1996 and 1999



* last 3 years
** more than 3 year s ago
Source: Sargant, (2000)

4.71 Whilst overall levels of participation in learning are important in relation to the potential for future skills development, perhaps equally as significant is the extent to which learning is undertaken by different groups in the population. For example, Bynner (in Coffield (ed), 2001) concludes that 'lifelong learning for all may be considered to have arrived when the differentials between the traditionally disadvantaged and

advantaged groups, as defined by a range of social and economic variables, are eliminated or much reduced' (p59).

4.72 The differentials referred to by Bynner are clearly demonstrated in the findings of the NIACE survey presented in Table 4.8. These demonstrate considerable inequalities in participation, with the following groups amongst the least likely to have engaged in current or recent learning:

- Older individuals - participation reduces significantly with age, with, for example 41% of those aged between 45-54 participating in learning compared to 70% of 20-24 year olds.

- The economically inactive - with 30% participating compared to 50% of those in jobs.

- Skilled, semi and unskilled working class - with around 30% participating compared to 51% of the lower middle class.

- Those who finished their initial full-time education at the earliest age - with less than 20% participating compared to 58% of those who completed their full time education aged over 18.

4.73 It is important to note too that levels of participation, across all groups, have remained relatively constant over the three years of the survey, with the exception of large increases in participation (of 8 percentage points, 1996-1999) occurring amongst part-time employees and those not working.

Table 4.8: Participation in education and training amongst different groups in the population

	% who had participated in current or recent (last 3 years) learning, 1996	% who had participated in current or recent (last 3 years) learning, 1999
All	40	40
Gender		
Male	43	41
Female	38	40
Age		
17-19	86	81
20-24	65	70
25-34	48	50
35-44	43	47
45-54	36	41
55-64	25	30
Employment status		
Full-time	49	51
Part-time	42	50
Unemployed	40	41
Not working	23	30
Retired	20	16
Socio-economic class		
Upper middle and middle class	53	58
Lower middle class	52	51
Skilled working class	33	36
Semi- and unskilled working class	21	24
Terminal age of full-time education		
Under 16	20	19
16-17	39	42
18+	59	58

Source: Sargant, (2000)

4.74 The significant divide between what can be termed ‘learners’ and ‘non learners’ is apparent when considering the likelihood of participation in learning in the future. The NIACE survey found that 38% of all adults were either very or fairly likely to take up learning in the next three years. However, whilst this included 76% of those who are currently learning and 60% of those who have participated in learning in the past three years, only 25% of past learners and 12% of those who have undertaken no learning since leaving full-time education indicated that they are likely to participate in the future.

Barriers to Achievement

4.75 Earlier in this chapter we provided evidence of substantial progress in educational attainment levels. However we also saw that there were important inequalities in qualifications across various groups in the workforce. In this section of the chapter we have outlined the main contours of people’s participation in learning. So, what are the main barriers to increasing participation and thereby to increasing both the overall skills and qualifications of the workforce and reducing the inequalities in learning participation?

4.76 NACETT (2000) identified a number of barriers in their final assessment of progress towards the previous National Learning Targets. Tackling these barriers will be important in raising educational levels through the reducing of inequalities in adult participation:

- Relatively low achievement amongst boys, when compared to that of girls, at ages 11 and 16;
- Large disparities in performance across LEAs in schools at all ages;
- Vocational qualifications are not given the same parity of esteem as academic qualifications;
- Insufficient numbers of the workforce are trained to level 3;
- The non-completion rate for vocational qualifications is high;
- Young women are significantly under represented in education and training at level 3;
- Adults face barriers such as lack of finance, lack of time and early unhappy learning experiences.

4.77 In addition to these potential barriers to achievement, NACETT also identify as a potential weakness in the structure of targets, the focus on the average, which 'risks overlooking the needs of minority groups'. As a result, they recommended the establishment of a wider group of sub targets 'designed to lever up standards at all levels'.

4.78 More generally, individuals who would be termed 'non-learners' can be split into two different groups (Hillage et al, 2000):

- Individuals that would like to undertake learning but are unable to do so because of external barriers;
- Those that do not want to engage in learning, through lack of confidence, motivation and disaffection.

Barriers to learning can, then, be categorised in the following way (ibid):

- Physical and material - e.g. finance and time
- Structural - around the way education and training is provided
- Attitudinal - including confidence and motivation.

4.79 These categories strongly reflect the findings of the NIACE survey when respondents (with the exception of those who had stated that they are 'very likely' to learn in the future) were asked if anything was preventing them from learning. The key barriers identified included:

- Not interested / don't want to - 27% (attitudinal)
- Work / other time pressures - 17% (physical and material)
- Too old / ill / disabled - 15% (physical and material)
- Childcare / caring responsibilities - 8% (physical and material)
- Cost - 7% (structural).

4.80 A similar survey undertaken for the OECD (2000) (see Table 4.9) suggests that time and cost are the key barriers facing those who would like to participate in job-related training but have not done so in the last year. The OECD benchmarks the situation in the UK with that in other OECD countries. Job-related training is more common than in any of the other OECD countries surveyed (see also chapter 5 below).

4.81 However, in relation to the barriers to participation identified by those who have not participated, a relatively high proportion of those in the UK identify cost, lack of employer support, time pressures at work and other institutional barriers (including provision of courses and inconvenient time of courses) as barriers, as compared to their OECD counterparts.

4.82 The converse to considering barriers to participation is to examine the factors that motivate individuals to learn. The importance of employment as a catalyst to participation in education and training is shown in the NIACE survey which found that 47% of those who had undertaken learning had done so for work related reasons; 35% had done so for personal development; and 11% had done so for reasons associated with education and progression.

Table 4.9: Perceived barriers to participation in job or career-related continuing education and training amongst employed adults (1994-95)

	% not taking job-related training in last year	% of those not taking training who wanted to participate	% of non-participants in job-related training who gave various reasons for not taking job-related continuing education and training that they wanted to take									
			Situational barriers				Institutional barriers				Dispositional barriers	
			Too busy / lack of time	Too busy at work	Family respons-ibilities	Lack of employer support	Course not offered	Too expensive / no money	Lack of qualific-ations	Inconvenient time	Language	Health
Australia	59	24	52	14	6	5	6	18	2	6	2	1
Belgium	78	16	59	19	7	5	1	7	2	4	3	-
Canada	62	30	53	11	21	9	6	21	2	10	-	-
Ireland	76	15	40	21	11	4	12	24	3	7	-	-
Netherlands	65	24	54	17	6	10	5	13	1	6	-	3
New Zealand	49	26	65	66	28	9	10	25	4	38	1	2
Poland	83	13	43	19	17	11	14	25	1	6	1	5
Switzerland (French)	74	32	44	21	4	9	11	18	3	7	0	2
Switzerland (German)	65	27	48	21	6	13	18	11	1	7	2	1
United Kingdom	44	20	37	22	8	17	13	25	1	17	-	2
United States	53	18	53	24	13	7	3	30	-	7	1	2

Source: OECD (2000) - Table C.7.7 Page 204

Workplace Training

Workplace training is a major potential means through which participation and attainment can be increased.

Patterns of Provision/Non Provision

4.83 There has been a significant growth in workplace learning in recent years. The Learning and Training at Work survey, for example, (Spilsbury 2001) reports an increase in the proportion of employers providing formal workplace training, from 68% in 1999 to 76% in 2000. 63% of employers offered a learning opportunity to staff in the year 2000 compared to just 45% in 1999. Furthermore off the job training was provided by 41% of employers in 2000 compared to 34% in the previous year and 26% of employees had received off the job training compared to 22% in the previous year. The Labour Force Survey, reports an increase in the proportion off-the-job employees that have received job-related training (in the previous 13 weeks) from 25% in winter 1995/96 to 28% in 2000/01.

4.84 Although these trends are encouraging, examination of the data reveals that access to learning in the workplace is unevenly distributed. It is clear that some companies are more likely to train than others and that certain categories of employee are disadvantaged in terms of the training they receive. This section of the chapter highlights the key differences and trends in the provision of, and access to, training within the workplace.

4.85 According to the Learning and Training at Work survey 2000 (Spilsbury 2001) 24% of employers had not provided any on-the-job or off-the-job training in the last 12 months. Here, on-the-job training is defined as that provided to an employee at their usual work position whilst off-the-job training is defined as that provided away from the immediate work position. By far the most commonly stated reason for not providing formal workplace training was that the existing skills of the organisation's workforce was felt by employers to be sufficient to meet business needs (77%).

Table 4.10: Reasons why workplace training was not provided by employers

Reason for not providing training	%
Existing skills of employees meet our needs so training not needed	77
New recruits are sufficient to obtain the skills required/already have the required skills	9
Lack of finance / cannot afford it	4
Training programme not yet in place	2
Employees too busy to give training	2
Employees learn from experience	2
Other	5

Source: Spilsbury (2001)

Inequalities in Training

4.86 Patterns of inequality emerge when examining the distribution of job-related training by occupation, qualification and age. Broadly speaking, the highest levels of formal workplace training are received by: employees in higher skilled occupations, those that are well-qualified and younger workers. In respect to occupation (see table 4.11) the LFS shows that employees within professional (50%), associate professional/technical (42%) and managerial/administrative occupations (28%) are amongst those most likely to have received training in the last 13 weeks. Employees working in plant/machine operative (15%), craft (18%) and other occupations (14%) are least likely to have received training. Moreover, this inequality in training participation is cummulative - those who do not receive it in one year tend also to be excluded in future years (Green 1999).

4.87 Not only are unskilled workers less likely to receive formal workplace training, they are often those whose experience of formal schooling has been poor and who are unlikely to access learning outside the workplace on their own initiative (Rainbird, 2000). It has been suggested that these workers may be more comfortable participating in informal rather than formal training, given that more formal settings are more likely to resemble classroom-based courses where they enjoyed limited success in the past (DfEE, 1999b). The extent to which informal training is undertaken within the workplace is unclear as most surveys tend wither to focus on the more structured activities that are undertaken as part of formal training, as it is easier to quantify than informal learning, though data referring to 'on the job' training will often incorporate informal training.

4.88 An examination of job-related training by highest qualification reveals that 43% of employees qualified at NVQ level 4, its equivalent, or above have received training in the 13 weeks prior to the LFS survey. This compares to around 28% of those qualified to NVQ or equivalent levels 2 and 3 and 20% of those qualified to NVQ level 1 or equivalent. Only 10% of those with no qualifications had received any formal workplace training.

4.89 Older workers are less likely to receive job-related training than younger employees. The LFS shows that, 21% of employees aged 50 or above participated in formal job-related training compared to 31% of those aged 25 to 49 and 38% of those aged between 16 and 24.

4.90 Participation in training also varies by sector. The highest proportions of employees who participate in training activity are to be found in public administration, education and health (24% in last 13 weeks); banking, finance and insurance (17%); and the Utilities (18%). The lowest are in agriculture, forestry and fishing (8%); manufacturing and construction (12%) each; and transport (11%).

4.91 More flexible ways of working are becoming increasingly common, with more workers taking up part-time and temporary work. Yet, whilst part-time workers are less likely to receive job-related training than full-time workers, the LFS indicates that incidence of training amongst non-permanent workers is slightly higher than that for permanent workers (see table 4.11). Green (1999) suggests that this may be partly due to the higher incidence of induction training amongst fixed-term employees.

Table 4.11: Percentage of employees receiving training in the last 13 weeks before the survey

	Percentage of employees	
	Winter 1995/96	**Winter 2000/01**
Occupation		
Managers/Administrators	26.6	27.6
Professional	45.0	50.3
Associate prof/Tech	38.7	41.6
Clerical/Secretarial	25.0	27.1
Craft and related	15.0	18.2
Personal/Protective	26.4	34.1
Sales	21.0	25.2
Plant/Machine Operatives	11.2	14.5
Other	10.5	14.0
Full-time/Part-time		
Full-time	26.4	30.4
Part-time	20.6	24.8
Permanent/Temporary		
Permanent	26.6	30.6
Temporary	30.0	33.6
Qualifications		
No qualifications	8.3	9.9
NVQ 1	17.7	20.1
NVQ 2	25.9	28.4
NVQ 3	23.4	27.8
NVQ 4 +	41.2	43.3
Age		
16 to 24	34.3	38.5
25 to 49	26.4	30.6
50 +	15.1	20.6
All employees	25.0	28.9

Source: LFS Winter 1995/96 and 2000/01

4.92 Establishment size is an important factor in the level and type of workplace training provided (see table 4.12). Smaller establishments are less likely to provide formal workplace training than larger ones, especially in respect to off-the-job training. 33% of employers within the 1 to 4 employee size band and 54% in the 5 to 24 size band provided off-the-job training in 2000, compared to over three quarters of establishments employing 25 or more employees. This disparity may reflect greater difficulties that smaller establishments face in resourcing training and arranging operational cover for workers undertaking off-the-job training. Smaller establishments are also less likely to have any internal training capacity, be in a position to benefit from economies of scale through bulk buying of training or have a formal business and/or training plan. It has also been suggested that the lower incidence of workplace training in smaller establishments can be partly explained by the generally lower perceived need for training due to infrequent recruitment and/or limited changes in technology or working practices amongst these employers (Johnson 1999). However, it is important to note that the provision of training in micro-establishments has increased rapidly between 1999-2000, with, large increases in the proportion providing both on and off the job training.

4.93 Again, the level of overall training activity may be underestimated in formal surveys given that informal training tends not to be measured. At one level, it has been suggested that informal learning, the transmission of 'tacit' knowledge, relating to the transfer of technical know-how, knowledge about markets or customer requirements and other forms of business-related knowledge, are generally seen as more relevant to the needs and circumstances of small and medium size enterprises than more formal training (Stern and Sommerlad,1999). Such training may take place during the normal course of the working day and may avoid the need to arrange operational cover for absent staff.

Table 4.12 Provision of training by employer size

No of employees	Off-the-job		On-the-job		Both		Either	
	1999 %	2000 %	1999 %	2000 %	1999 %	2000 %	1999 %	2000 %
1-4	25	33	49	59	15	22	58	69
5-24	47	54	77	81	37	45	87	90
25-99	72	78	85	89	62	70	95	97
100 - 199	82	92	88	94	74	87	97	99
200 - 499	89	96	94	93	83	90	99	100*
500 +	91	98	94	92	86	90	99	100*
Total	**34**	**41**	**58**	**66**	**24**	**31**	**68**	**76**

Source: Spilsbury (2001)

Training 'Quality'

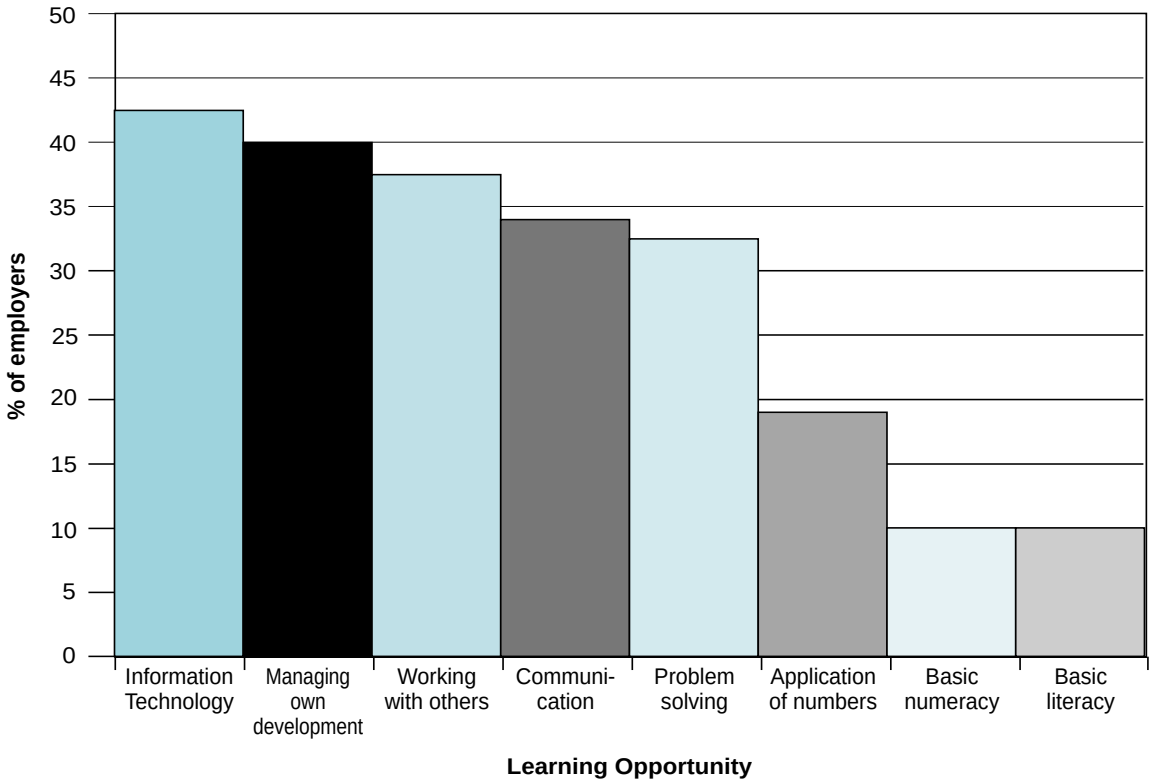
4.94 The quantity and distribution of workplace training is of importance but it would also be valuable to consider the 'quality' of training provided. Unfortunately, measuring the quality of training is difficult and it is necessary to rely on proxy indicators, such as whether or not training leads to a qualification and the type and duration of training provided.

4.95 In terms of qualifications, 31% of job-related training (undertaken by employees in the last 13 weeks) leads to some sort of qualification (LFS, 2000/01). Whilst findings from the Learning and Training at Work 2000 survey (Spilsbury 2001) indicate that 46% of employers providing off-the-job training report that some of the training leads to formal qualifications compared to 43% in 1999. When asked about the type of qualifications, 48% of employers in the 2000 survey indicated that training was leading to ‘other nationally recognised qualifications’ such as RSA, BTEC and City and Guilds, 46% stated NVQs/SVQs, 32% stated ‘other qualifications specific to the company’ and 24% indicated that it was leading to higher qualifications such as degrees.

4.96 The extent to which training leads to qualifications is skewed towards larger businesses. Larger businesses are much more likely to offer off-the-job training leading to formal qualifications than smaller organisations. Only 39% of businesses in the 1 to 4 size band and 51% within the 5 to 24 size band provide training leading to formal qualifications compared to 73% in the 100 to 199 size band and 90% in the 500+ size band.

4.97 Turning to the type of workplace learning, there is evidence to suggest that the provision of on-the-job training is significantly higher than off-the-job training. According to the Learning and Training at Work 2000 survey, 41% of employers have provided off-the-job training and 90% on-the-job training within the last 12 months. Furthermore, training relating to information technology (43%), managing your own development (41%), working with others (38%), communication (34%) and problem solving (32%) were amongst those most commonly provided by employers in 2000 (see figure 4.7).

Figure 4.6: Learning opportunities provided by employers



Source: Spilsbury (2001)

4.98 A significant proportion of job-related training is short term. The LFS indicates that 41% of training lasts for less than 1 week. This compares to 11% lasting between 1 week and 6 months, 13% lasting between 6 months to 2 years and 35% lasting 3 years or more.

4.99 In respect to the number of days of training received, the Learning and Training at Work survey shows that the average number of days training provided over the last 12 months per trainee has decreased slightly from 8.6 in 1999 to 8.2 in 2000. Conversely, the average number of days training per employee, whether trained or not, has increased from 1.9 days in 1999 to 2.2 days in 2000.

4.100 Differences in the duration of training can also be identified across businesses of different size. The average number of training days per trainee was 8.2 in each of the 1 to 4, 5 to 24 and 25 to 99 employee size bands, compared to 6.8 in the 200 to 499 size band and 6.5 in the 500+ size band (Learning and Training at Work survey, 2000). Thus, whilst smaller employers are less likely to provide training than larger ones, the average number of training days provided per trainee in companies that do train tends to be relatively higher for small and medium size businesses.

The Geography of Skills

4.101 So far, this chapter has examined the key issues and trends in respect to educational attainment, participation in learning and workplace training. How significant are variations in such indicators of skills levels across the regions and, indeed, across the 'sub regions' as bounded by the new 47 Learning Skills Councils? An earlier paper for the Skills Task Force (Campbell et al, 1999) drew attention to this issue in terms of its importance in skills policy and the broad pattern of skill variation. It also demonstrated an association between such variations and variations in a range of indicators of local economic performance. This section of the chapter will, in turn, examine geographical variations in qualifications attainment; variations in participation in post compulsory education; and variations in workplace training.

Attainment of Qualifications

4.102 There are significant regional variations in the attainment of qualifications. As can be seen from table 4.13, the proportion of those of working age that have attained NVQ level 3, or its equivalent, and above varies by 10 percentage points, from a high of 47% in London to a low of 37% in the North East. Broadly speaking, on this measure, skill levels are highest in Southern regions, with London, the South East and South West having the highest proportion of individuals that have attained NVQ level 3 and above. Together with the North West (just) skill levels in each of these regions is above the average for England as a whole where 42% of individuals of working age have attained NVQ level 3, or equivalent, and above. Regions falling below the English average include the North East (37%), West Midlands (38%), East Midlands (39%), Yorkshire and the Humber (39%) and the Eastern region (40%).

4.103 A similar pattern emerges in respect to regional differences in the proportion of adults achieving level 4, or equivalent. As before, London ranks the highest with 31% of people of working age having attained NVQ level 4, or equivalent, whilst the North East has the lowest proportion at 18% - a difference of 13 percentage points between the highest and lowest attainment levels. Overall it is in the Southern regions, including London, the South East and South West which are above the average for England whilst the situation in regions located north of these regions is below average.

Table 4.13: Percentage of individuals of working age with NVQ 3+ and NVQ 4+ by Government Office Region

	% attained NVQ level 3 +	% attained NVQ level 4 +
East Midlands	39.1	20.3
Eastern	40.3	21.7
London	46.7	30.5
North East	36.6	18.3
North West	42.6	22.2
South East	45.8	26.1
South West	44.1	24.8
West Midlands	38.1	20.5
Yorkshire and The Humber	39.2	20.2
England	42.2	23.6

Source:LFS December 2000 to February 2001

4.104 We can examine the variations at the more finely grained level of the new LSC areas. In respect of the proportion of adults achieving NVQ level 3 or equivalent (see table 4.14 and figure 4.7) differences of up to 22 percentage points are evident, with London Central having the highest proportion of individuals of working age that have attained NVQ level 3 (or its equivalent) or above at 54% and The Black Country the lowest at 32%. Generally, the areas of highest skill, on this measure, are to be found in South Central England with 'outliers' in North Yorkshire and Cheshire. Areas with the lowest skill levels are in Northern Central England, the East Coast and Cornwall and Devon.

Figure 4.7 Geographical Variations in Skill Levels: Level 3

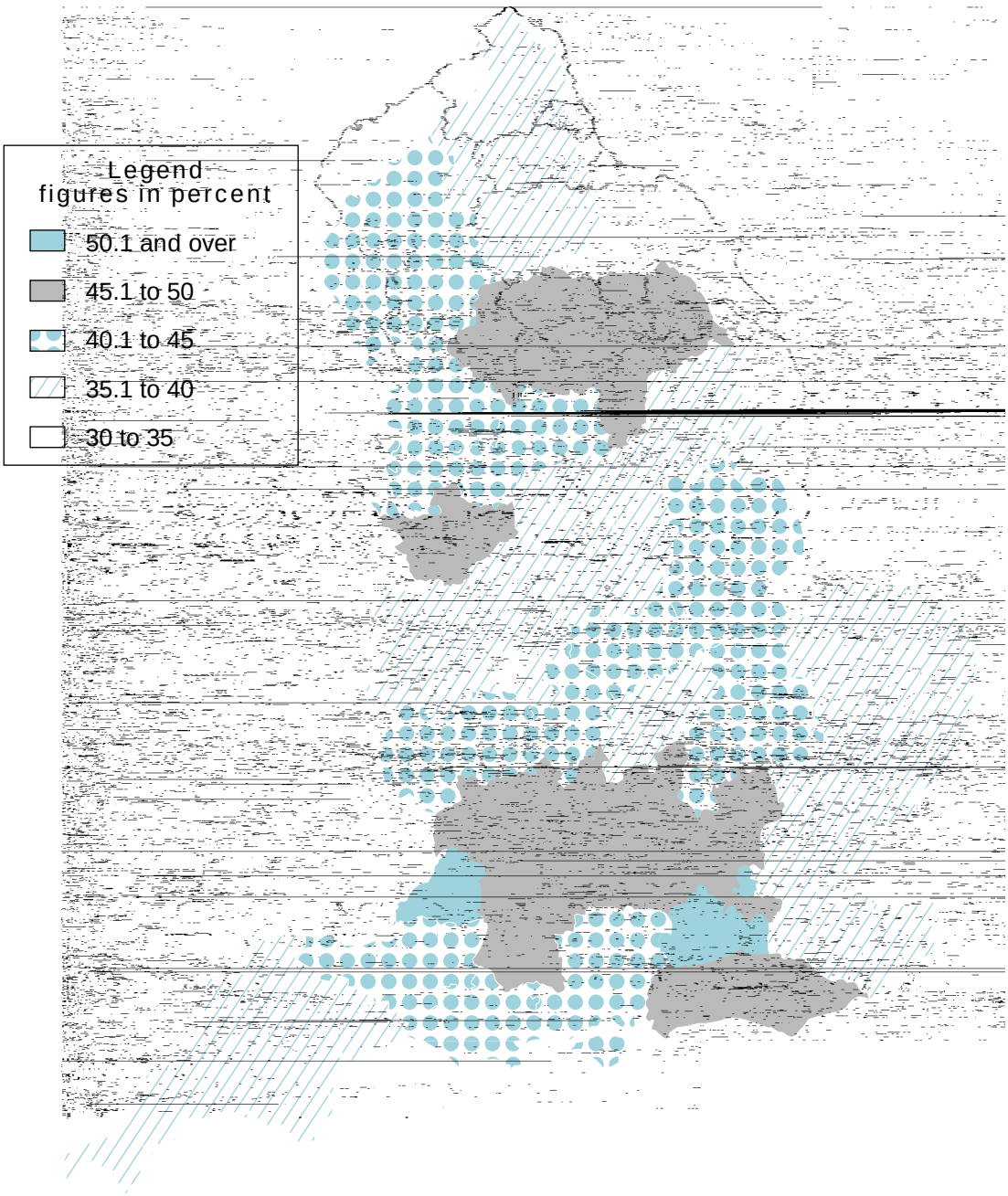


Table 4.14 Percentage of individuals of working age with NVQ level 3+

LSC area	%
London Central	54
Surrey	53
West of England	51
Oxon/Bucks/Milton Keynes	50
Hertfordshire	49
East Sussex/West Sussex/Brighton & Hove	49
Berkshire	48
Gloucestershire	48
London West	48
London South	48
Wiltshire/Swindon	47
London North	47
Cheshire/Warrington	46
North Yorkshire	45
Somerset	44
Coventry/Warwickshire	44
Lancashire	44
Herefordshire/Worcestershire	43
Cambridgeshire	43
Bedfordshire	43
Hamps/Isle of Wight/Portsm'th/S'thampton	43
Leicestershire	42
Greater Manchester	42
Bournemouth/Dorset/Poole	42
Cumbria	41
Merseyside/Halton	41
Lincolnshire/Rutland	40
West Yorkshire	40
London East	40
Shropshire	39
Northumberland	39
Devon/Cornwall	38
Derbyshire	38
Tyne & Wear	38
Birmingham/Solihull	38
Kent/Medway	38
Nottinghamshire	37
Northamptonshire	37
Essex	37
Humberside	37
County Durham	37
Staffordshire	36
Suffolk	36
Norfolk	36
South Yorkshire	36
Tees Valley	33
The Black Country	32
England	42.2

Source: LFS December 2000 to February 2001

4.105 Turning towards the proportion of adults at level 4 or equivalent, attainment rates vary by around 26 percentage points i.e. by more than the national average itself, with Central London having the highest rate at 41% and Tees Valley the lowest at 15% (see

table 4.15 and figure 4.8). The highest attainment levels are found in London Central (41%), Surrey (36%), London West (31%), Berkshire (30%) and London South (30%). However, attainment at NVQ level 4 is below the average for England in nearly 2 in 3 of LSC areas. These are very substantial skill variations indeed and give cause for major concern, not only in terms of the prospects for future progress in increasing skill levels, but in terms of the economic prospects in many localities.

Figure 4.8 Geographical Variations in Skill Levels: Level 4

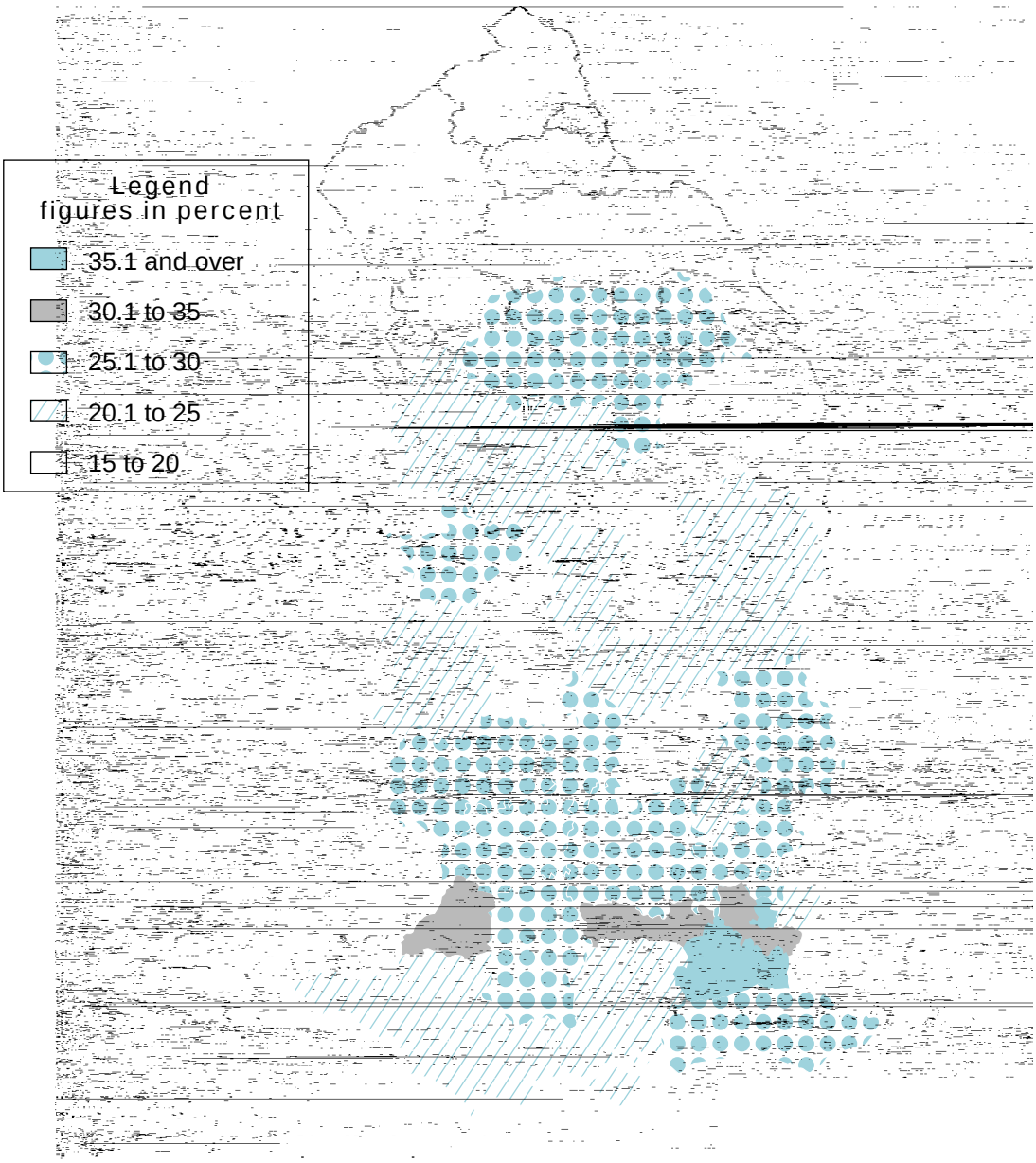


Table 4.15 Percentage of individuals of working age with NVQ level 4+

LSC area	%
London Central	41
Surrey	36
London West	31
Berkshire	30
London South	30
West of England	30
Gloucestershire	29
Oxon/Bucks/Milton Keynes	29
Hertfordshire	29
Wiltshire/Swindon	29
London North	28
Cheshire/Warrington	28
Cambridgeshire	27
East Sussex/West Sussex/Brighton & Hove	27
Coventry/Warwickshire	27
Herefordshire/worcestershire	27
North Yorkshire	25
London East	24
Somerset	23
Bedfordshire	23
Bournemouth/Dorset/Poole	23
Shropshire	23
Lancashire	23
Greater Manchester	22
Hamps/Isle of Wight/Portsm'th/S'thampton	22
Leicestershire	22
Derbyshire	21
West Yorkshire	21
Lincolnshire/Rutland	21
Merseyside/Halton	20
County Durham	20
Nottinghamshire	20
Devon/Cornwall	20
Northumberland	19
Tyne & Wear	19
Cumbria	19
Birmingham/Solihull	19
Kent/Medway	19
Staffordshire	18
Suffolk	18
South Yorkshire	18
Humberside	18
Norfolk	18
Essex	17
Northamptonshire	17
The Black Country	16
Tees Valley	15
England	23.6

Source: LFS December 2000 to February 2001

4.106 GCSE attainment rates tend to be highest in the South of England. As can be seen from table 4.16, the percentage of pupils achieving five or more GSCEs grade A* to C is above the average for England in the South East, South West and Eastern

regions. The South East has the highest percentage of pupils achieving five or more GSCEs grades A* to C at 54% whilst the North East has the lowest at 41% - a difference of 13 percentage points. In each region, females outperform males by 10% or 11% points.

Table 4.16 Percentage achieving 5 or more GCSEs grades A* to C in 1998/99

Government Office Region	%
South East	53.8
South West	52.8
Eastern	52.2
East Midlands	47.1
London	46.7
North West	46.0
West Midlands	45.1
Yorkshire and The Humber	41.9
North East	40.8
England	47.9

Source: Regional Trends Vol 35 (2000)

Participation in Learning

4.107 Not only do young people within the South generally outperform those in the North, they are also more likely to participate in full-time education. As can be seen from table 4.17, London, the South West and South East regions have above average participation rates of 16 to 19 year olds in full-time education. Participation is highest in London where 67% of individuals aged 16 to 19 are in full-time education compared to the North East where only 54% participate in full-time education. However, the location of Higher Education institutions does bias these figures in favour of regions with large scale HE provision.

Table 4.17: Percentage of individuals aged 16 to 19 in full-time education

Government Office Region	%
London	67.3
South West	65.0
South East	62.5
North West	58.9
West Midlands	58.9
East Midlands	58.4
Yorkshire and The Humber	56.7
Eastern	56.4
North East	53.6
England	60.4

Source: LFS December 2000 to February 2001

4.108 Table 4.18 below shows participation in learning for individuals aged 17 or over within each of the English regions in 1999. Here the disparity between regions is not as marked. As can be seen, participation in current or recent learning is highest the East Midlands and East Anglia (48%) and lowest in the North/West Midlands (34%) and the South West (37%). Table 4.18 also indicates that the proportion of individuals who have not participated in formal learning since full-time compulsory education is above the UK average in the North (43%), West Midlands (40%) and the South West (40%).

Table 4.18 Participation in learning by Government Office Region

	Base -all respond	Current learning	Recent learning	All / recent learning	Past Learning	None since full -time ed
London	603	26	20	46	18	36
South East	953	23	19	42	23	35
South West	418	23	15	37	23	40
East Anglia	183	27	20	48	25	27
East Midlands	359	27	21	48	18	34
West Midlands	456	16	18	34	26	40
North West	558	20	21	41	24	35
Yorkshire and Humberside	424	23	18	42	23	35
North	264	17	17	34	23	43
Total (UK)	5054	22	18	40	23	37

Source: Sargant, (2000)

Training

4.109 Table 4.19 below shows the proportion of employers in England providing workplace training in each of the English regions. Yorkshire and Humberside (a region that has tended to perform relatively less well in respect to other indicators) has the highest levels of provision of both on-the-job (75%) and off-the-job (48%) training. On-the-job training is least likely to be provided by employers in London but is also below the average for England in the South East and South West. It is interesting to note that training levels appear, overall, to be lower in higher qualification and higher employment regions - the inverse of what is the case for individuals.

Table 4.19 Provision of training by region, 2000

	Off-the-job (%)	On-the-job (%)
London	38	61
South East	39	61
South West	39	61
Eastern	37	66
East Midlands	46	68
West Midlands	37	66
North West	46	73
North East	42	74
Yorkshire and Humberside	48	75
Total	41	66

Source: Spilsbury 2001 (Tables 21 and 52)

Key Findings

Workforce Qualifications and Inequalities

- There has been considerable progress in educational attainment over recent years. However in respect of young people, attainment amongst boys at level 2 is relatively low, as it is amongst some ethnic minority groups.

- A number of barriers to increasing educational attainment have been identified which relate to, inter alia, the uptake (and completion) of vocational options; limited progression amongst females from level 2 to level 3; and barriers to participation in education and training amongst adults. It will be necessary to tackle these barriers so as to increase the volume of vocational qualifications and increase the proportion of women who progress from level 2 to level 3, in order to stimulate the supply of skills at level 3.

- There remains a considerable proportion of the economically active who have either no qualifications or qualifications below NVQ level 2 or equivalent. In addition, attainment levels are highly uneven across the workforce with the unemployed, economically inactive, older individuals, those employed in manual occupations and some ethnic minority groups, notably Black and Pakistani/Bangladeshi people, being considerably disadvantaged in relation to educational achievement. It is most important to boost achievement among these groups on grounds of social inclusion and in order to stimulate skills supply, especially where skills imbalances are significant.

- In particular minority ethnic groups will account for a significant proportion of workforce growth in the future and, as such, their qualification levels are of particular importance, especially in localities where they already constitute a large proportion of the actual/potential workforce.

- Poor basic skills are a significant issue. More than 1 in 5 adults are estimated to have low or very low levels of literacy (below that expected of an average 11 year old), and nearly half have low or very low levels of numeracy.
- There has been a considerable increase in the supply of individuals qualified to NVQ level 4, potentially 'at the expense' of those who, previously, would have achieved intermediate level qualifications via employment based training accompanied by part-time college study. This could result in a shortage in the supply of people with the work experience and commercial understanding that employers require for some intermediate level jobs.

- There remains a dominance of academic, rather than vocational, qualifications within the workforce. When considering highest qualification achieved, more than half of the economically active population hold an academic qualification, with only just over one quarter holding vocational qualifications. Academic qualifications are particularly predominant at levels 2 and 4.

Types, Levels, Routes and Destinations

- In terms of academic qualifications, a higher proportion of those entering A levels are achieving a pass, in all subject areas, than was the case three years ago, and the number of first degrees awarded has increased by almost 10,000 since 1995/96.

- Despite concerns over the shortage of young people achieving qualifications that would enable them to develop higher level technical skills in maths and engineering, entries to maths A levels exceed those for all other subjects, with the exception of General Studies, though the number of maths entries is falling. There has, also been a decline in the number of first degrees awarded in engineering over the last three years, suggesting that relatively high rates of participation in maths A levels are not converting to high levels of participation in technical related HE subjects.

- The numbers obtaining first degrees are increasing by a little over 1% per year but with particularly large increases in subjects allied to medicine, biological sciences, librarianship, creative arts and design and computer science. The largest absolute declines have been experienced in architecture, building and planning; engineering and technology, and education.

- Across all types of qualifications there have been increases in the numbers studying and achieving qualifications in computer and business related areas. In addition, much of the focus of vocational qualifications is in service-sector related areas. The distribution of vocational qualifications is highly skewed occupationally.

- Over 1 million vocational qualifications were awarded in 1999/2000 - nearly half of which are NVQs - 25% higher than in 1995/6. Over half of all awards at levels 2 and 3 are vocational, largely being obtained by more mature students.

- Whilst the AMA and FMA programmes provide one of the key routes through which NVQs are achieved, the majority of those leaving these courses are not obtaining a full qualification at either level 2 or level 3.

- There has been a slight increase in those undertaking study at sub-degree level for HNC and HND qualifications over the last four years but the increase is much slower than in the early 1990s. However, registrations in some technical subjects, including construction and engineering have declined significantly over this time period though in IT they have increased considerably.

- Destinations vary significantly depending on the type and level of study previously undertaken: destinations from full-time FE indicate that progression to higher level qualifications is a key outcome of this route through learning, whilst destinations from HE are more likely to be employment based. Destinations from work based training for young people remain mixed, with a high proportion of positive outcomes (employment, education or training) from the AMA, but much lower success rates in other forms of training.

Participation

- ❑ The proportion of young people participating in education post 16 has increased considerably over recent years. This has been an important factor in the increase in the qualifications of the workforce. However, compared to most other OECD countries, youth participation is very low.

- ❑ Participation in adult learning, as measured by the NIACE survey, has remained relatively constant since 1996, with approximately 40% of adults classed as 'current or recent (last 3 years) learners'. However, issues relating to definitions of adult learning are apparent when considering that the National Adult Learning Survey measured participation rates at 76% in 1998.

- ❑ There are significant disparities in participation rates in learning across different groups in the workforce. In particular, low levels of participation are apparent amongst older individuals, the economically inactive, those from the 'lower' class backgrounds and those who completed their initial education at the earliest age.

- ❑ Barriers to participation in learning can be categorised in a variety of different ways. Broadly speaking, they fall into three groups including the physical and material (eg finance and time), structural (around provision) and attitudinal (including confidence and motivation).

- ❑ Participation in all forms of education, including FE, HE and GST, each leading to different levels and types of qualifications, has increased in recent years.

Workplace Training

- ❑ Workplace training has increased in recent years. However, access to such training is unevenly distributed amongst the workforce. Certain groups of employees, such as unskilled workers, the less well-qualified, part-timers and older workers, are amongst those least likely to receive formal job-related training. Significant sections of the workforce are excluded from formal training activities within the work place.
- ❑ Establishment size is an important determinant of the level and type of workplace training provided. Smaller establishments are less likely to provide formal workplace training than larger ones, especially in respect to off-the-job training. They are also less likely to provide training that leads to formal qualifications. However, training in very small establishments appears to be increasing.

- ❑ The provision of on-the-job training is significantly greater than off-the-job training. Furthermore, approximately 31% of job-related training undertaken by employees (in the 13 weeks before the LFS) leads to some sort of qualification.

- ❑ A significant proportion of workplace training is short-term. There is evidence to suggest that approximately 41% of training lasts for less than 1 week. The average number of days training provided per trainee was around 8.2 in 2000 - a slight decrease from the previous year.

The Geography of Skills

- Significant regional differences exist in respect to levels of qualifications amongst the workforce. Generally, the proportion of the workforce qualified to the higher levels of NVQ or equivalent, is greatest in the South, particularly in London, the South East and South West, whilst progress in Northern regions, including the North East and Midlands, lags behind.

- However, variations in skill levels are even greater at the more finely grained level of LSC subregional areas than at the regional level. Variations of up to 25% points exist in the proportions of people qualified to NVQ levels 3 and 4 or equivalent, and even more in terms of the proportion of young people participating in full-time education.

- The proportion of the workforce qualified to NVQ level 3 or equivalent is below the England average in approximately half of the LSC areas and in nearly two-thirds of LSC areas in terms of NVQ level 4 or equivalent.

- GCSE attainment rates and participation of 16 to 19 year olds tends to be highest in the South of England and lowest in the North East and Yorkshire and The Humber.

- Regional variances in respect to the provision of workplace training are also important. The highest levels of training are provided in Yorkshire and Humberside and the lowest levels in the South, including the South East, London and South West.

- Overall, the significant disparities in local/regional performance across different parts of England, will restrict the chances of improving skills supply nationally or achieving LSC priorities, unless they are vigorously tackled.

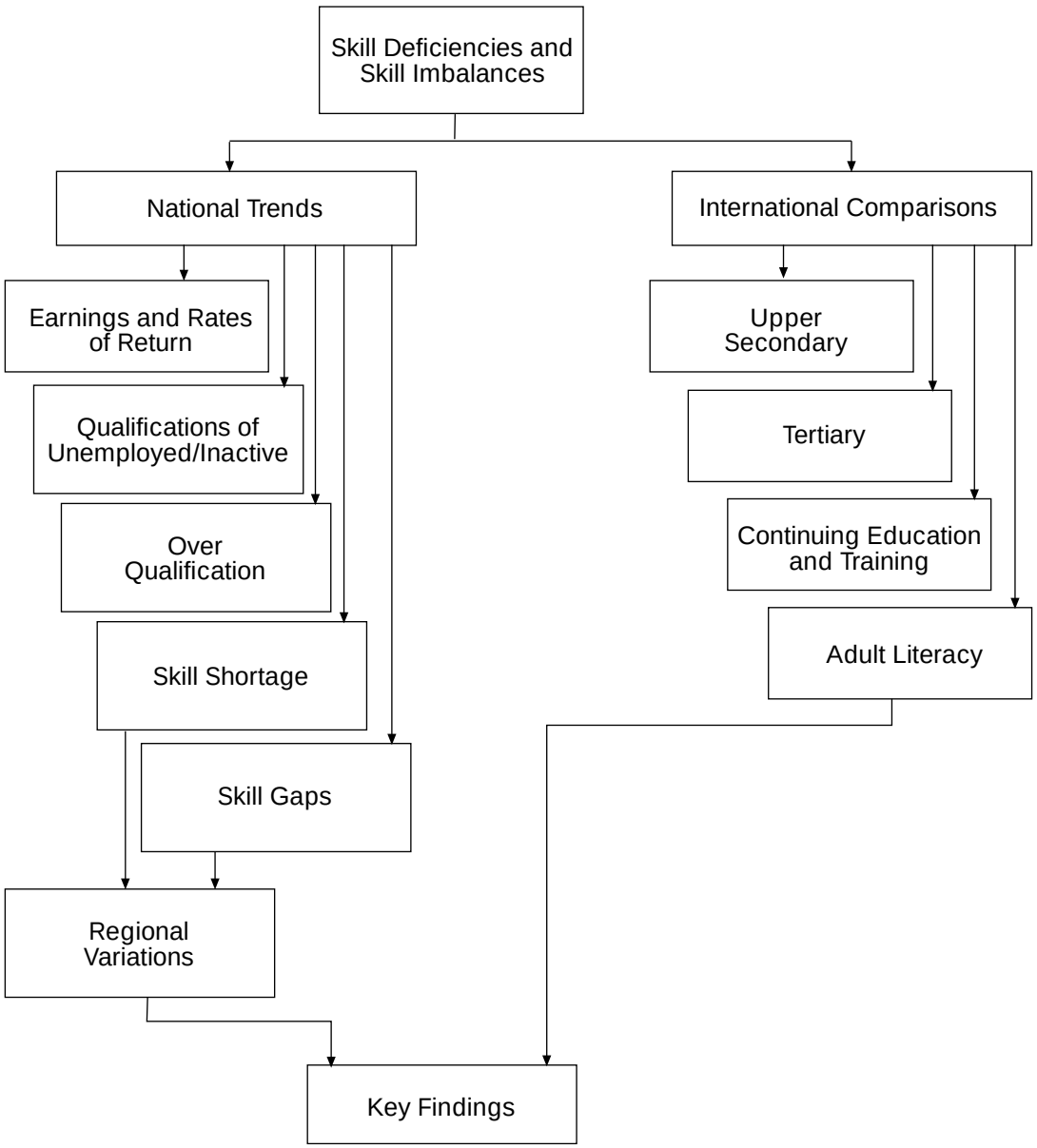
Chapter 5

Skills Deficiencies and Imbalances

This chapter examines skill deficiencies and skill imbalances. First, we examine the national situation. We begin by examining trends in wage differentials across occupations, rates of return to different levels of qualifications, and the qualifications/occupations of the unemployed and inactive, in order to consider the role that such intelligence can play in identifying skill imbalances. Then, using large scale employer based survey data, we examine the extent and nature of skill shortage vacancies and skill gaps in England, and how these vary across sectors, occupations, sizes of establishments, regions and localities, with a view to identifying the scale and nature of current imbalances between skill supply and demand, as articulated by employers.

Second we examine the situation in terms of benchmarking the U.K. through the comparison and positioning of UK performance relative to other OECD countries. This is done in terms of upper secondary education/qualifications (NVQ level 2 or equivalent); tertiary education/qualifications; and in terms of continuing education and training. Finally, using the results of the international adult literacy survey (IALS), an assessment is provided of the UK's position in terms of adult proficiency in literacy and numeracy skills.

The structure of the chapter is illustrated in the orientation chart below.



Introduction

In previous chapters we have identified a range of skills issues through an assessment of recent, current and future trends in the demand for skills and an examination of the supply of skills. In this chapter we widen our assessment in two ways.

5.1 First, we draw together a number of aspects of the relation between skill demand and supply, through two means. The examination of occupational earnings trends, 'returns' to education/training and comparison of the qualifications and previous occupations of those not in employment, provide indications of those skills which the labour market are 'rewarding' and 'penalising'. In other words they give impressions of the nature of skill imbalances in the labour market. However these are not able to provide the necessary detail required, for a comprehensive understanding of demand/supply imbalances. We therefore turn to an analysis of the skill requirements of employers through both an assessment of the skill shortage vacancies they experience when seeking to recruit workers and the skill gaps that exist within their current workforce. These both provide direct and contemporary evidence of the nature of the 'excess' demand over the available supply of skills in both the external and internal labour markets, which can be examined by sector, occupation, size of establishment and region in order to obtain a detailed portrait of skill imbalances.

5.2 Second, we position various aspects of the U.K.s skills performance in an international context. Comparisons with other OECD countries help us to benchmark our position and map our progress, not just through comparisons with our 'domestic' past, but through assessing ourselves in relative, international terms, against many of our competitor nations. A range of sources and methodologies are drawn upon in order to undertake this analysis and provide an overall assessment. The skill deficiencies that we examine go beyond our discussion of skills supply and skills demand which has been assessed above by discussing their interrelations and imbalances that emerge (e.g. skill shortages, skills currently not required, wage trends and rates of return) and by assessing other relevant potential skill deficiencies, such as our skills performance in an international context.

Skill Deficiencies and Imbalances – National trends

5.3 This section of the chapter draws together and assesses a wide range of evidence on skill imbalances and deficiencies. In turn, we examine evidence on earnings and rates of return, the skills of the unemployed and the relation between qualifications and skills deployed, before turning to the use of large scale employer surveys in identifying and examining skill shortage vacancies and skill gaps. We conclude with brief discussion of potential or latent skill gaps.

Wage Differentials

5.4 A widening of occupational wage differentials may provide evidence of the demand for such skills growing faster than available supply. On this basis, long term trends suggest that most professionals/associate professionals and managers experienced relatively rapid earnings growth. In the shorter term, and at a more

detailed occupational level, the pattern is more complex and differs in several respects between men and women.

5.5 Trends in occupational wage differentials can be used as an indicator of growth in labour market demand relative to the supply of appropriately skilled labour. Put simply, relatively rapid growth in earnings in a particular occupation suggests that demand for labour and skills associated with that occupation is growing at a faster rate than the available supply. Using wage differentials as an indicator of potential skills imbalance this section examines trends in average gross weekly earnings in England using data from the New Earnings Survey and expressed as a ratio of earnings in 'other' elementary occupations in that year. It updates material in the NSTF research report (NSTF 2000a) and goes to provide a more detailed occupational profile.

5.6 However it is important to emphasise that caution is required when making inferences about skills imbalances based on trends in earnings. It may not always be the case that employers raise wage levels in response to labour market conditions. 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 changes in other than overall market conditions including the competitive position of individual employers and their profitability.

5.7 Examining earnings trends over the last 25 years in England (see annexes 5.1 and 5.2) earnings within all managerial, professional and associate professional occupations are those that have increased the fastest for both men and women between 1975 and 2000. Those that experienced no, or very slow, increases in relative earnings include - for men: a wide range of occupations, most especially clerical and secretarial occupations; skilled construction and other skilled trades; personal service occupations; and a range of operative occupations. For women, the range of occupations where relative wage increases have been low are fewer but include: personal service occupations, other sales and the operative occupations.

5.8 There are no substantial changes to report over the last 2 years except a decline in male relative earnings in the 'other' associate professional occupational group.

5.9 Whilst it is possible to identify broad trends using the 22 sub-major occupational groups above, a more detailed picture emerges through an examination of earnings trends based on the 72 'minor' occupational groups. Annex 5.1 shows the average gross weekly earnings for males in 1995 and 2000 ranked in terms of percentage change. The greatest increase in earnings over this period took place in general manager and administrator occupations, where there was an average increase of 36% in earnings. Relatively high percentage increases in earnings also occurred within the following occupations: specialist managers (29%), woodworking trades (29%), health professionals (26%), security/protective service occupations (25%), production managers within manufacturing and construction etc (25%), and sales assistants and check out operators (25%). The lowest increases occurred amongst receptionists, clerical/secretarial and process operatives.

Table 5.1: Male average gross weekly earnings in England by sub-major occupational group (as a proportion of 'other' elementary occupations)

	1975	1980	1985	1990	1995	1998	1999	2000
Corporate Managers/ Administrators	1.57	1.65	1.85	2.06	2.28	2.35	2.39	2.34
Managers/Proprieters: Agric/Services	1.02	1.14	1.25	1.30	1.50	1.48	1.48	1.48
Science/Engineering Professionals	1.53	1.57	1.67	1.77	1.92	1.93	1.91	1.90
Health Professionals	1.97	2.19	2.53	2.68	2.89	3.05	3.09	3.01
Teaching Professionals	1.58	1.43	1.58	1.69	1.92	1.83	1.83	1.85
Other Professional Occupations	1.46	1.57	1.70	1.89	1.95	2.05	2.03	2.04
Science/Engineering Associate Profs	1.19	1.28	1.45	1.58	1.52	1.57	1.57	1.57
Health Associate Professionals	1.18	1.20	1.20	1.33	1.42	1.42	1.45	1.44
Other Associate Prof Occupations	1.45	1.58	1.71	1.97	2.07	2.14	2.17	1.99
Clerical Occupations	0.92	0.94	1.01	1.03	1.06	1.02	1.02	1.00
Secretarial Occupations	1.21	1.18	1.23	1.15	1.22	1.10	1.11	1.07
Skilled Construction Trades	1.04	1.01	1.00	1.04	1.08	1.08	1.10	1.11
Skilled Engineering Trades	1.16	1.19	1.28	1.31	1.39	1.42	1.39	1.39
Other Skilled Trades	1.08	1.08	1.10	1.11	1.12	1.13	1.14	1.13
Protective Service Occupations	1.20	1.35	1.53	1.40	1.42	1.44	1.45	1.46
Personal Service Occupations	0.93	0.96	0.95	0.90	0.93	0.89	0.88	0.89
Buyers, Brokers/Sales Representatives	1.18	1.27	1.41	1.47	1.49	1.51	1.52	1.51
Other Sales Occupations	0.89	0.89	0.90	0.89	0.84	0.83	0.88	0.87
Industrial Plant/Machine Operators, etc	1.09	1.12	1.14	1.15	1.19	1.19	1.16	1.15
Drivers/Mobile Machine Operators	1.16	1.15	1.18	1.12	1.12	1.13	1.12	1.12
Other Occupations:Agric/ Forestry/Fishing	0.83	0.88	0.84	0.87	0.93	0.90	0.94	0.90
Other Elementary Occupations	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 no earnings data by occupation is yet available using SOC 2000.

Table 5.2: Female average gross weekly earnings in England by sub-major occupational group (as a proportion of 'other' elementary occupations)

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

Source: New Earnings Survey

5.10 In respect to females (see annex 5.2), the greatest increase in earnings between 1995 and 2000 took place within legal professional occupations, in which there was an increase of 40%. Relatively high percentage increases in earnings also occurred in sales occupations (35%), and road transport operatives, i.e. drivers of road goods vehicles (31%). Relatively small earnings increases, on the other hand, were experienced in travel, clerical/secretarial, librarian, printing and personal services. These changes in earnings are indicative of recent trends in the balance between the demand for, and supply of, labour in particular occupations and thus potentially in skill imbalances.

The Returns to Qualifications

5.11 The evidence from analysis of rates of return (i.e. the increase in earnings over the qualification immediately below) suggests large rates of return, especially to higher level qualifications, both academic and vocational. Whilst returns to lower level qualifications are smaller, the returns to those with lower prior ability are high. The returns to literacy and numeracy are also found to be high.

12 Recent research provides an analysis of relative rates of return to different levels and types of qualifications compared to having no qualifications (Dearden et al, 2000). The research finds relatively high returns for most academic qualifications for both men and women. The key findings are as follows (see also section 1.20 above):

- GCSEs/"0" levels produce a return of 12-21% for men and 10-19% for women
- GCE "A" levels produce an additional 15-18% return for men and an additional 18-23% for women
- First degrees produce an additional 10-28% return for men and an additional 21-26% for women

This means that, for example, men acquiring A levels on average earn between 27% and 39% more per annum than those without any qualifications.

5.13 The returns to NVQ Level 3 vocational qualifications are generally lower than those accruing to their academic equivalents such as A Levels with returns for males acquiring an NVQ 3, 4 or 5 qualifications securing a 6% to 9% return and females earning between 1% and 5%. The estimated return to males for gaining an ONC/OND is between 7% and 12% and for females 8%. The return for males holding the City & Guilds craft and advanced qualifications are estimated at between 4% and 7% and 7% to 10% respectively.

5.14 However, if account is taken of the different lengths of time required to obtain qualifications then the rate of return to vocational qualifications at NVQ level 3 or higher bear comparison with their academic equivalents. For example, the annualised rate of return for an ONC/OND of 5_% to 9_% pa for men is comparable to A-Levels (7_% to 9_%). However, the same is not true for women where equivalent estimates of rates of return are 9% to 11_% pa for A-Levels and 6_% for an ONC/OND. Nonetheless such comparisons need to be treated cautiously as the results are sensitive to the assumptions made about the length of time taken to complete vocational courses.

5.15 The rate of return to HNC/HND qualifications compared to first degrees, at least for men, is also comparable. The estimated returns to HNC/HND's for men range between 6% and 22% giving an annualised rate of return of 5% to 12% which compares favourably with the estimated rate of return to males gaining first degrees of between 3% and 9%. Again these results are sensitive to assumptions about the time taken to complete the programmes. The results for women show smaller returns.

5.16 The highest rate of return is however gained by those acquiring professional qualifications. For men the rate of return for a professional qualification ranges from 15% to 35% and for women from 2% to 40%

5.17 However, while annualised rates of return to vocational qualifications at Level 3 and above are comparable to those gained through academic qualifications, there is little evidence of good rate of returns for vocational qualifications below that level. The study reveals no return to lower level NVQs for either gender. For men, there is no evidence of a good rate of return to lower level City and Guild qualifications. However, when account is taken of differences in prior ability, 'low ability' individuals experience positive rates of return at level 2 - males 4% and females 9%. Moreover their rates of return at NVQ levels 3 and 4 are even higher and are well above 'high' prior ability level groups.

5.18 These estimates of rates of return do not, however, provide information on subjects of study and so are unable to shed light on which specific skill areas generate the highest rates of return. They do, however, give an indication of the levels of qualification where the market appears likely to reward any additional supply.

5.19 We can also examine rates of return to literacy and numeracy skills. Dearden et al (2000) found a large positive impact on earnings in respect of numeracy at 'entry' level and NVQ level 1. The effect of enhanced literacy skills on earnings is similarly large. The effect on employment is also positive for both literacy and numeracy with a possibly larger effect for literacy than numeracy.

5.20 Individuals with level IALS 1 numeracy skills earn around 15-19% more than those with skills below this level. Even after controlling for qualification level and family background the wage premium is still between 6-7%. Moreover, individuals with level 1 numeracy skills are around 5% points more likely to be employed. Individuals with IALS level 1 literacy skills earn around 15% more than those without skills at this level and are around 5% points more likely to be employed.

Qualifications and Occupations of the Unemployed/Inactive

5.21 The qualification levels and occupational background of the long term unemployed and economically inactive are markedly different from those currently in employment. This provides us with an indication of the types of skills, as proxied by qualifications and occupations, which are in excess supply.

5.22 Here we examine the qualification levels of the long-term unemployed (six months or more) and economically inactive in England, as well as their previous occupation, in order to obtain an indication of the skills that are currently in excess supply. This is of

particular importance not only to the unemployed/inactive themselves, in relation to their prospects of accessing the evolving pattern of labour market opportunities, but also to the economy as a whole, because they represent a potential, but currently unused, source of labour supply. However, on both counts, if their skill base is currently inadequate, this raises key issues that need to be addressed.

5.23 Examining the qualification levels of the long-term unemployed and economically inactive is one important way of assessing what skills these groups possess. By comparing the highest qualification of these groups with those of the employed population, it is possible to assess the extent to which there is an imbalance between their skills and those currently held by those in employment. In this sense, such a comparison provides an indication of the skills that are not currently in demand, and in a sense represent the other side of the coin from the skill shortages examined later in the chapter.

5.24 The most notable difference between those in employment, and those that are either long-term unemployed (defined by ILO standards) or inactive, is that those in employment are much more likely to have higher level qualifications (NVQ 3 and above), and individuals that are long-term unemployed or inactive are much more likely to have low level qualifications (NVQ 1 or 2), or no qualifications at all (see figure 5.1).

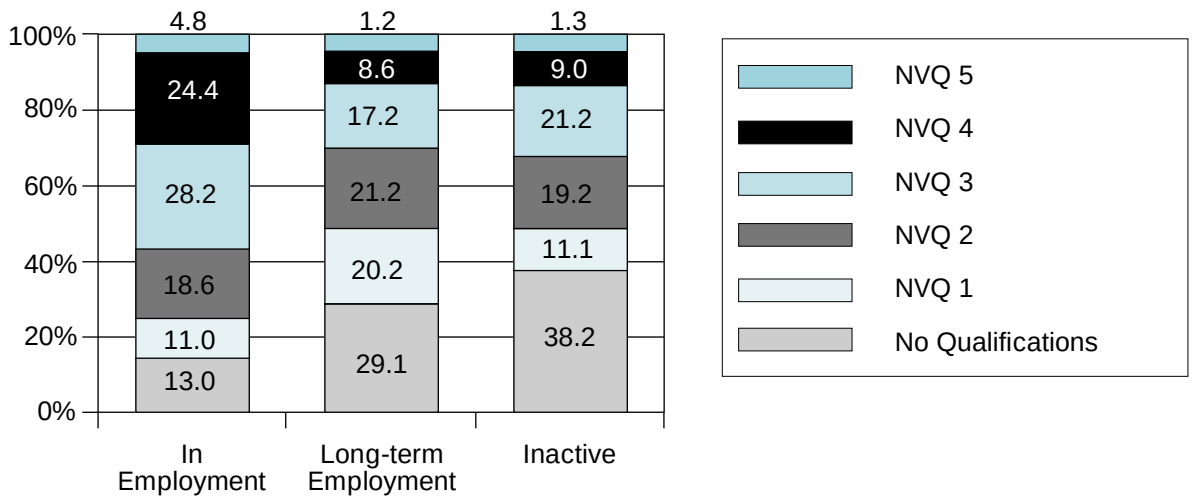
5.25 Comparing the highest qualification of the long-term unemployed and inactive with those in employment, two substantial differences emerge:

- 29 per cent of the long-term unemployed and nearly 40 per cent of the inactive have no qualifications at all, whilst only 13 per cent of those in employment are unqualified.

- Only 32 per cent of the inactive and 27 per cent of the long-term unemployed have NVQ 3 equivalent, or above, qualifications whereas 57 per cent of the employed possess such qualifications.

On this basis, there exists an excess supply amongst those with no qualifications, those with level 2 qualifications and, to a lesser extent, those with level 1 qualifications.

Figure 5.1: Highest Qualification level of those in employment, the long-term unemployed and the inactive, Dec 2000 - Feb 2001 (England)



Source: National Statistics, Labour Force Survey, Dec 2000 – Feb 2001.

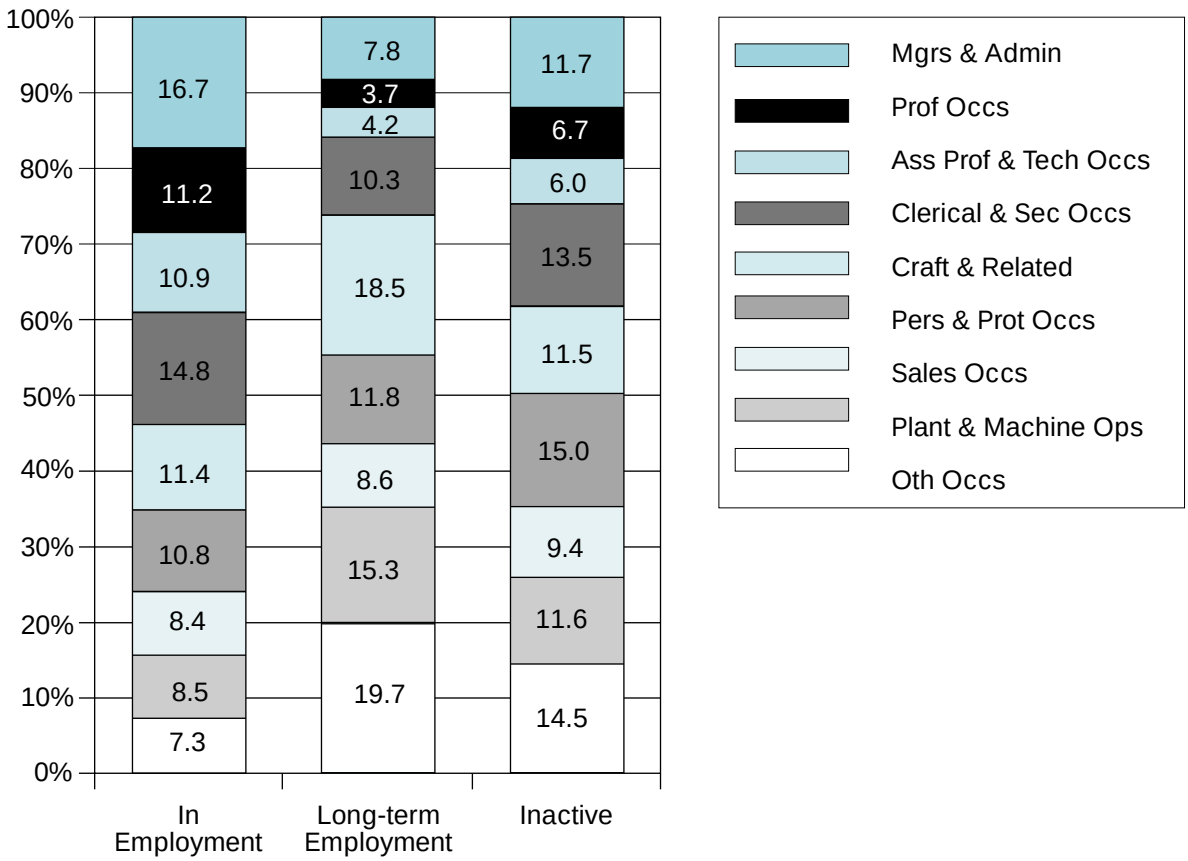
5.26 Examining the previous occupation of the long-term unemployed and inactive is another way of assessing the extent of any imbalance between their skills and those who are currently employed. Figure 5.2a compares the last occupation of the long-term unemployed and inactive, with the present occupation of those currently in work.

- 39 per cent of those in employment are in managerial, professional and associate professional and technical occupations, whilst only 16 per cent of the long-term unemployed, and 24 per cent of the inactive were formerly in these occupations.

- Before they ceased being employed, 35 per cent of the long-term unemployed and just over a quarter of the inactive were in non craft related manual occupations, but currently these occupations only account for 15 per cent of employment.

- Just under a fifth of the long-term unemployed population were formerly employed in craft occupations whilst currently these occupations make up only 11 per cent of employment.

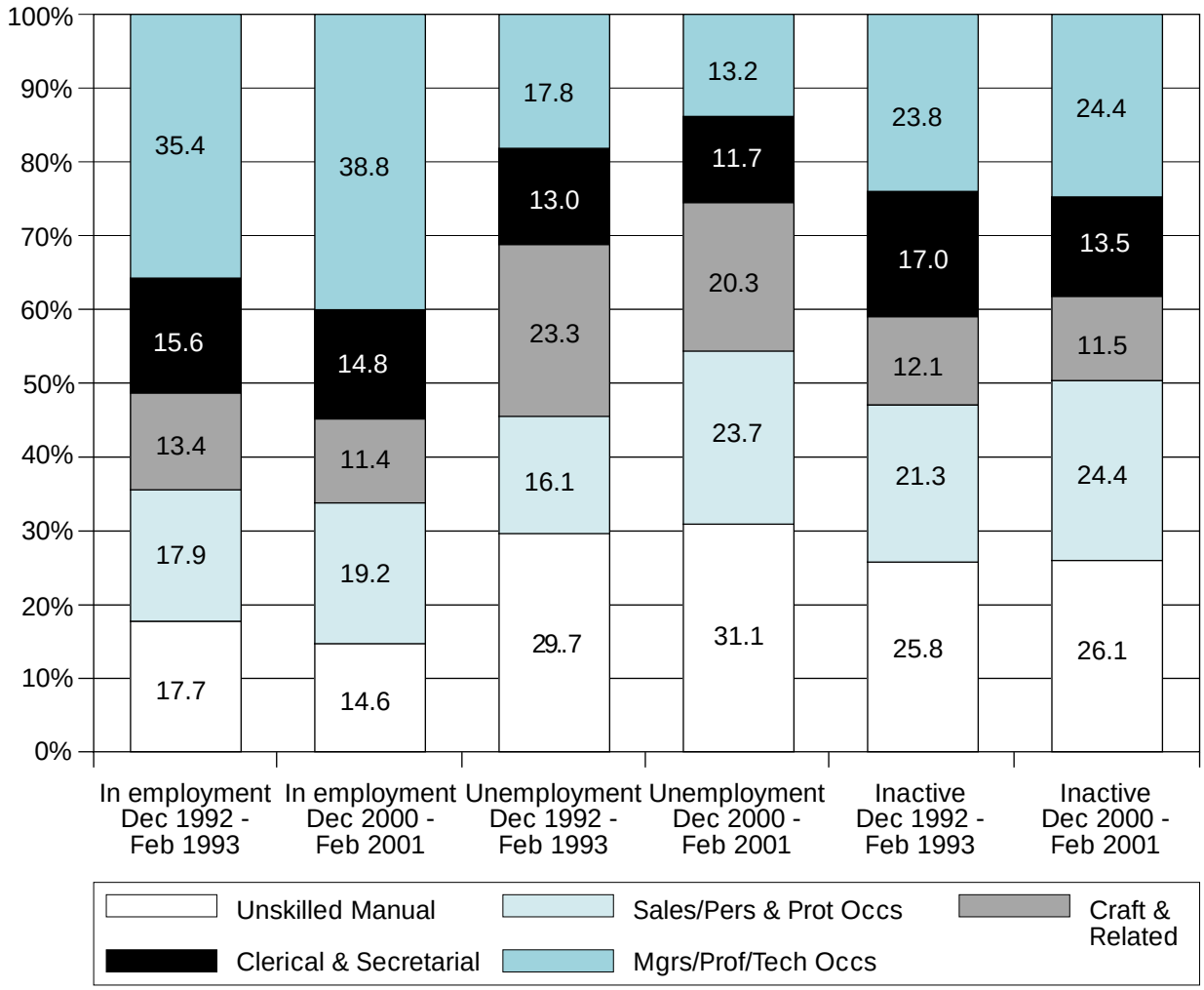
Figure 5.2a: Occupation of those in employment, and last occupation of the long-term unemployed & inactive, Dec 2000 - Feb 2001 (England)



Source: National Statistics, Labour Force Survey, Dec 2000 – Feb 2001

The data suggests that excess supply is greatest in plant and machine operative and craft occupations.

Figure 5.2b: Current occupation of the employed, and the last occupation of ILO unemployed and the inactive, Dec 1992 - Feb 1993 & Dec 2000 - Feb 2001



Source: National Statistics, Labour Force Survey, Dec 1992 – Feb 1993 & Dec 2000 - Feb 2001

5.27 However if we consider the trend in how the occupations of the employed, long-term unemployed and inactive have changed over the past eight years (see figures 5.2b) we can see that in terms of changes in the occupations of the employed, the most notable differences are the increases in the proportion of people employed in managerial/professional/technical occupations and to a lesser extent the increase in the proportion employed in sales and personal/protective service occupations. In examining change in the last occupation of the long-term unemployed and inactive, however, a very different picture emerges. The proportion of long-term unemployed that were formerly in managerial/professional/technical occupations has actually decreased slightly over the past eight years, from 17 per cent to 16 per cent. Moreover, the proportion of the long-term unemployed whose previous occupation was unskilled manual has increased, whilst the proportion who were in sales/personal and protective occupations has also increased. However the proportion who were craft and related has declined substantially. In this sense skill surpluses are increasing most in sales/personal and protective occupations and in unskilled manual occupations, but are falling in craft and related occupations – an indication of the increasing demand, perhaps, for such workers.

Overqualification and Overeducation

5.28 We saw in previous chapters that there has been considerable increases in the qualification levels of the employed workforce. However, trends in qualification levels may not give a wholly useful or unambiguous guide to employer skill requirements, if (a) the supply of more highly qualified people is not effectively absorbed into the labour market and actually utilised in the world of work or (b) the jobs actually acquired by people do not need that qualification to effectively undertake the job i.e. does the job actually require 'fewer skills' than the individual actually possesses. Clearly, both imply a growth of qualification attainment beyond actual qualification requirements, and represent a waste of scarce resources devoted to the supply and acquisition of qualifications and in addition in the second case, may lend 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). This section of the chapter therefore draws attention to 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.

5.29 So far we have presented evidence elsewhere in this report which suggests that there is indeed real, required skills upgrading taking place in terms of high and increasing earnings differentials between high/low qualification workers; rates of return to different levels of qualification; and the wide variety of indicators and evidence from the demand side of increasing skill needs and skill use. Furthermore, compared to other OECD countries, those with tertiary level education, for example, enjoy a higher wage premium and probability of employment in the UK (OECD 2001b).

Here we provide evidence, in turn, in relation to the 2 conditions (a) and (b) above i.e. absorbtion of qualified people into employment and the actual skill requirements of jobs.

5.30 First, are more highly qualified people being effectively absorbed into the labour market? An OECD report (OECD 2001b, pages 162 and 170: Chart C4.2 and Table 4.2) shows that the demand for highly qualified persons is growing faster than their supply in nearly all OECD countries and certainly in the UK. The percentage point increase in the proportion of people with tertiary level (largely degree level) qualifications in the employed population, is increasing faster than the percentage point change in the proportion of people with such qualifications in the working age population. In the UK case, over the period 1989-96 the growth in the former was 7.5% compared to a growth in the latter of 6.4%. Demand is growing faster than supply.

5.31 Second, Green et al (2000) have also examined this issue using the Skills Survey and similar previous surveys. They investigated, at different qualifications levels, the changes in the proportions of people who are employed in jobs where the qualifications that they hold are not required of those who are being recruited. Over the period 1986-97 there was a small increase at the highest level, stability at sub-degree level and a small decrease at lower levels. They conclude that there is ‘no evidence of substantially rising overeducation’ (p100). However, preliminary analysis of the follow-up 2001 survey suggests that there has been a small increase in the extent of overeducation over the last four years.

5.32 Green et al (2000) also examined whether workers agreed that the qualifications which were required of recruits were genuinely necessary for doing their job. A

decrease in the perceived necessity of the qualification would be evidence of employers inflating their qualifications requirements beyond what was required for doing the job. They found that at level 2 there was an increase over the period 1986-97, from 65% to 72%, in the proportion who indicated that the qualifications required in recruitment were indeed actually required to do the job effectively. At levels 1,3 and 4/5 it declined slightly over the same period. Preliminary results from the follow up 2001 survey suggest, however, that there has been a decrease since 1997 in the proportions where the qualification was deemed necessary, especially at the lowest level of qualification (NVQ1 level). This finding shows the importance of examining both the expanding supply-side and the expanding demand-side of the skills market.

5.33 Overall then, the supply of more highly qualified people has, at least until the late 1990s, largely been absorbed into employment. The jobs that people do, generally do require the qualifications that people have acquired. Nevertheless the continued utilisation of qualifications needs to be monitored regularly.

Skill shortages

5.34 This section of the chapter focuses on the extent and nature of skill deficiencies. Skill deficiencies are examined in terms of how they vary by sector, occupation and establishment size. The type of skills being sought by the employers who are experiencing skill deficiencies is also explored and an assessment is also made of the extent to which such skill deficiencies affect organisational performance. The Employers Skills Survey 2001 (ESS) commissioned by DfES and undertaken by IFF Ltd in association with IER. (Hogarth et al 2001), provides the findings on which this section is based.

5.35 ESS 2001 consisted of a total of 27,031 telephone interviews and was establishment based. The main respondent was the senior person responsible for human resource or personnel issues. All interviews took place in England and all sectors of business were covered (both public and private). All establishments with a minimum of one person employed were included in the survey. Interviews were conducted between November 2000 and April, 2001. The sample was stratified by region, establishment size and sector and results grossed up to be representative of the total number of establishments in England (just over 2 million). This survey differed from the 1999 ESS in that all establishments in England were included – the 1999 survey excluded the agriculture sector and those establishments with under 5 employees.

5.36 It is important, however, to first make two general observations. The overall position on the balance of skills demand and supply may well tighten further over the coming years. It is anticipated (Wilson et al 2001, b) that over the period to 2010 an additional 2.13 million jobs will be generated. In order to meet this increase in demand, activity rates will have to rise so as to increase the size of the labour force to levels that can sustain such jobs growth. An increase in activity rates from 78% to 81% would just about provide for the same overall quantitative balance between supply and demand as in 1999. It will be essential, of course, to ensure that those entering the labour market over this period, in particular those moving from the currently economically inactive, have the necessary skills required by employers in this context of continuing jobs growth.

5.37 In particular, in the South East and East regions, it is anticipated that demand is likely to rise faster than available supply (i.e. new jobs are likely to grow faster than activity rates) – by some 57,000 in the former case and 36,000 in the latter (Wilson et al 2001b) – putting further pressure on the overall skills demand/supply balance and necessitating further inflows of commuters and/or migrants.

5.38 Second the nature and extent of skill shortage vacancies may well vary over the economic cycle, so it is important to recognise that the assessment of skill shortage vacancies provided here, is based on data collected at a business cycle peak.

5.39 Throughout this section, reference is made to **recruitment difficulties**, hard to fill vacancies and **skill shortage vacancies**. **Recruitment difficulties** are defined as occurring in the external labour market where an employer identifies a vacancy as being hard-to-fill. **Skill shortage vacancies** are a sub-set of hard-to-fill vacancies and are defined as a situation where at least one of the following reasons for recruitment difficulties have been identified:

- Low number of applicants with the required skills;
- Lack of work experience the company demands;
- Lack of qualifications the company demands.

5.40 We first examine the overall level of skill shortage vacancies in the economy and the skills that are sought in these vacancies. We then go on to examine their sectoral and occupational distributions and how they vary by establishment size, before turning to an assessment of the consequences of such shortages on organisational performance, including an indication of the occupations in which shortages are most associated with a performance impact and identification of which sectors are most at risk.

The Overall Level of Skill Shortage Vacancies

5.41 ESS 2001 reports that around 14% of all employers reported vacancies at the time of the survey (see table 5.3). This represents approximately 766,000 vacancies in the labour market. Just over half of these vacancies were described by employers as hard-to-fill i.e. 8% of employers and approximately 358,000 jobs in total. Around one half of these recruitment difficulties were skill related i.e. 4% of establishments have skill shortage vacancies which, in total, affect 159,000 vacancies.

5.42 When comparison is made with the 1999 ESS survey, and thus referring only to establishments with 5 or more employees and excluding the agriculture sector, this represents a small reduction in the number of vacancies, hard to fill vacancies and skill shortage vacancies. The proportion of establishments reporting vacancies has declined, from roughly 1 in 3 to just over 1 in 4, whilst the proportion experiencing hard to fill vacancies has declined from 16% to 14% and the proportion experiencing skill shortage vacancies has declined from 8% to 6%.

5.43 On the face of it, therefore, the overwhelming majority of establishments do not experience such skill shortage problems. However, one fifth of all actual vacancies display a skill shortage and, as we shall see, the uneven duration, nature and distribution of these skill shortage vacancies, by occupation, sector and location means that they disproportionately affect some parts of the economy and labour market more than others.

Table 5.3: Overall number of vacancies, hard-to-fill vacancies and skill shortage vacancies

	% of all establishments reporting	Number of vacancies ([a]) '000s
2001		
All Establishments		
All vacancies	14	766
Hard-to-fill vacancies	8	358
Skill-shortage vacancies	4	159
2001		
Establishments with 5 or more employees[b]		
All vacancies	27	532
Hard-to-fill vacancies	14	232
Skill-shortage vacancies	6	94
1999		
Establishments with 5 or more employees		
All vacancies	32	558
Hard-to-fill vacancies	16	247
Skill-shortage vacancies	8	102

Source: Hogarth et al (2001) Tables 2.1 and 6.3; pages 6 and 140
Base: All establishments
Note: (a) Grossed up survey-based estimates.
(b) This is the corresponding sample to that used in ESS1999.

5.44 Whilst the overall level of skill shortage vacancies has fallen since the 1999 ESS there have also been some changes in the sectoral and occupational density of skill shortage vacancies (i.e. skill shortage vacancies as a proportion of employment). In general, there has been a decline in the density of skill shortage vacancies though two sectors show small increases in the density of skill shortage vacancies since 1999: Business Services and Public Administration. Occupationally all groups experienced a decline in the density of skill shortage vacancies with the exception of professional occupations and elementary occupations which both saw a 100% increase in the density of skill shortage vacancies. There has also been a change in the distribution of vacancies, hard-to-fill vacancies and skill shortage vacancies with respect to establishment size. Remembering that these comparisons exclude establishments employing less than 5 people, there has been a move away somewhat from smaller establishments (5-24 employees) towards the larger establishments. In 1999, 50% of skill shortage vacancies were found in establishments with between 5 and 24 employees but this has fallen to around 38% in 2001.

5.45 By definition, recruitment difficulties and skill shortage vacancies take longer to fill than other vacancies. ESS 2000 reports that over one quarter of hard-to-fill vacancies and over one third of skill shortage vacancies take over six months to fill. This together

with the type of skills sought, further highlights the significant issues facing establishments experiencing skill shortage vacancies. Table 5.4 shows the full distribution of skills sought. In addition to technical and IT related skills, there are significant levels of generic transferable skills being sought in relation to skill shortage vacancies. The most common skills sought in relation to skill shortage vacancies are: “Other’ technical and practical (34% of all skill shortage vacancies); Advanced IT (20%); Customer handling (16%); Company specific (15%); Communication (13%) and; team working (11%).

Table 5.4 Skills Sought in Connection with Skill Shortage Vacancies

Skill Sought	% of all skill shortage vacancies
Basic Computing	7
Advanced IT	20
Other Technical/ Practical	34
Communication	13
Customer Handling	16
Team Working	11
Foreign Language	2
Problem Solving	8
Management	7
Numeracy	9
Literacy	7
Other	16
Company specific	15
Personal attributes	8
Experience	5
Driving	3

Source Hogarth et al table 2.19; p 37
Base: All Skill Shortage Vacancies

Sectoral Distribution of Skill Shortage Vacancies

5.46 Skill shortage vacancies are disproportionately concentrated in certain sectors of the economy. Five sectors - Manufacturing, Construction, Wholesale and Retail, Business Services and Health and Social Care- account for 79% of all skill shortage vacancies whilst employing 64% of the total workforce. As Table 5.5 indicates, the proportion of skill shortage vacancies (column 2) is greater than the share of total

employment (column 1) especially in the construction and business services but also in the health and social care sector of the economy.

Table 5.5 Distribution of Skill Shortage Vacancies by Sector

Sector	Distribution of total employment, England	Distribution of skill shortage vacancies	Total Number of skill shortage vacancies	Skill shortage vacancies as a % of employment	Skill Shortage vacancies as a % of all vacancies
Agriculture	1	1	1146	0.5	11
Manufacturing	17	13	21443	0.6	28
Construction	4	10	15438	1.7	39
Wholesale & Retail	18	12	18516	0.5	15
Hospitality	5	4	5881	0.5	10
Transport & Communications	6	5	7215	0.6	14
Financial Services	4	3	4253	0.5	15
Business Services	15	33	51749	1.7	28
Public Administration	6	2	2729	0.2	10
Education	7	3	5314	0.4	17
Health and Social Care	10	11	16945	0.8	20
Other Services	5	5	8013	0.8	17
TOTAL	100	100	159081	0.8	21

Source: Hogarth et al (2001) tables 2.7 and 2.9; pages 17 and 21
Base: As specified at column head

5.47 It is also apparent that no sector is immune from skill shortage vacancies. However the Public Administration and Education sectors have, overall, the lowest 'density' of skill shortage vacancies (as a % of employment) when compared to other sectors of the economy. However, because labour turnover and vacancy rates vary by sector, all else being equal, sectors which experience low labour turnover may produce low 'densities' of skill shortage vacancies. Hence, the final column of table 5.5 shows the number of skill shortage vacancies as a proportion of total vacancies. This shows that skill shortage vacancies are a serious recruitment problem particularly in construction, manufacturing and business services.

5.48 Table 5.6 shows the distribution of sectoral skill shortage vacancies across occupations. For example, in construction, skill shortage vacancies are concentrated in skilled trade occupations and within business services, professional and associate professional occupations experience the greatest shortages.

Table 5.6 Overall distribution of skill-shortage vacancies by sector and occupation

Row percentages

	Managers/ senior officials	Professionals	Associate Professionals	Admin/ Secretarial	Skilled trades	Personal Services	Sales & Customer service	Operatives	Elementary occupations	Total Weighted Base		Unweighted Base
Agriculture	2	0	4	8	38	0	0	19	29	100	1146	38
Manufacturing	3	7	9	4	50	0	4	21	2	100	21443	1708
Construction	1	4	7	1	79	0	1	5	2	100	15438	651
Wholesale, retail trade	4	1	17	7	20	*	42	5	3	100	18516	504
Hotels & restaurants	4	0	0	5	20	*	17	*	54	100	5881	385
Transport & communication	*	3	4	10	1	2	7	57	13	100	7215	509
Finance	33	3	26	34	0	0	5	0	0	100	4253	401
Business services	6	42	24	7	5	*	7	7	1	100	51749	2099
Public Administration	5	12	30	39	0	2	1	0	11	100	2729	233
Education	*	58	14	2	*	18	4	0	3	100	5314	397
Health & Social care	2	3	36	5	2	49	1	*	2	100	16945	2080
Other Services	4	1	5	2	5	66	2	*	5	100	8013	302
Total	5	18	18	7	20	9	9	9	5	100	159081	9357

Base: All skill-shortage vacancies
Source: Hogarth et al (2001) – table 2.13b; page 28

Occupational Distribution of Skill Shortage Vacancies

5.49 Examination of the occupations experiencing skill shortage vacancies provides a further insight into the composition of such skill shortage vacancies. Table 5.7 indicates the distribution of skill shortage vacancies by occupation relative to the numbers employed in the occupational groups and once again present our 'density' measure of skill shortage vacancies. Skill shortage vacancies disproportionately occur in certain occupational groups. Just three occupational groups account for well over half (56%) of skill shortage vacancies – professional; associate professional and technical occupations; and skilled trades occupations – yet they only account for 30% of total employment.

Table 5.7 Distribution of Skill Shortage Vacancies by Occupation

Occupation	Distribution of total employment, England	Distribution of skill-shortage vacancies	Total Number of skill shortage vacancies	Skill shortage vacancies as a % of employment
Managers/senior officials	16	5	7436	0.2
Professional	13	18	28886	1.1
Associate professional/ technical	8	18	28287	1.7
Administrative/secretarial	15	7	10831	0.3
Skilled Trades	9	20	31592	1.7
Personal service	7	9	14889	1.0
Sales/Customer Service	13	9	14500	0.6
Process, plant, and machine operatives	11	9	14440	0.7
Elementary occupations	8	5	8100	0.5
TOTAL	**100**	**100**	**159081**	**0.8**

Source: Hogarth et al (2001) tables 2.5 and 2.13a; pages 15 and 27

5.50 These occupations also experience a higher density of skill shortage vacancies than average: most especially, associate professional and skilled trades occupations. Skill shortage vacancies are least prevalent among managers and administrative/secretarial occupations in particular.

Table 5.8 Skills sought in connection with skill-shortage vacancies

Column percentages

Occupations	Managers/ senior officials	Professionals	Associate Professionals	Admin/ Secretarial	Skilled trades	Personal Services	Sales & Customer service	Operatives	Elementary occupations	Total
Skill										
Basic Computing	23	16	1	23	1	2	4	3	2	7
Advanced IT	21	51	41	22	2	3	4	2	1	20
Other Technical/ Practical	43	29	24	23	64	22	13	39	28	34
Communication	16	4	8	17	6	33	35	11	15	13
Customer Handling	36	3	8	44	5	41	38	8	12	16
Team Working	41	2	4	7	5	32	23	11	9	11
Foreign Language	1	2	4	2	1	2	1	1	2	2
Problem Solving	38	5	4	23	5	7	5	6	6	8
Management	27	5	8	8	2	5	18	2	2	7
Numeracy	31	3	3	13	5	28	18	4	6	9
Literacy	9	1	2	27	4	4	16	9	7	7
Company specific	32	19	14	15	15	15	4	14	5	15
Sales/marketing	*	*	4	1	0	0	5	0	16	1
Personal attributes	2	1	2	15	1	3	33	22	3	8
Experience	7	4	6	5	5	3	6	6	1	5
Driving	*	*	1	0	0	*	2	24	1	3
DK/NS	5	10	9	8	14	29	4	9	29	13
Weighted Base	7436	28886	28287	10831	31592	14889	14500	14440	8100	159081
Unweighted Base	327	1993	2036	896	1188	760	533	1077	537	9357

23. Base: All skill-shortage vacancies
Source: Hogarth et al (2001) – table 2.19; page 38

5.51 Table 5.8 indicates the actual range of skills being sought in relation to skill shortage vacancies across different occupational groups. For example, managerial and senior officer occupations appear to have the most varied range of skills being sought with most skill types being sought in at least 20% of skill shortage vacancies. The most sought after skill however is in non-IT technical and practical skills (43%). Amongst professional occupations the main skills being sought are Advanced IT skills (51%), and non-IT technical and practical skills (29%). Skill shortage vacancies amongst associate professional occupations relate mainly to advanced IT (41%) and other practical/technical skills (24%).

5.52 Skills sought in connection with Administrative/ Secretarial occupations have a wider range with the top three being customer handling; literacy, and non-IT technical / practical skills. Amongst craft workers the skills sought are overwhelmingly 'other' technical/practical skills.

5.53 If we examine the distribution of these occupational skill shortage vacancies by sector (see table 5.9) we find, for example, that managerial skill shortage vacancies are primarily concentrated in business services and, to a lesser extent, in the financial sector. Professional skill shortage vacancies are almost wholly found in the business services and (to a much lesser extent) in the educational sector. Associate professional skill shortage vacancies are found predominantly in business services, and in the health and social work sectors. Craft and Related occupational skill shortage vacancies are, unsurprisingly, predominantly found in the manufacturing and construction sectors. Personal service skill shortage vacancies are overwhelmingly found in the health and social work and other community services sectors.

Skill Shortage Vacancies and Establishment Size

5.54 We have seen that skill shortage vacancies are disproportionately concentrated in certain occupations and sectors. Table 5.10 and figure 5.3 shows the distribution and density of skill shortage vacancies across different sizes of establishment.

5.55 40% of all skill shortage vacancies are found in establishments employing less than 5 people despite the fact that only 12% of total employment is accounted for by such establishments. Skill shortage vacancies here are equivalent to 3% of total employment in establishments of this size, and on this density measure are nearly 4 times as prevalent as in any other size band. Indeed, skill shortage vacancies represent a decreasing proportion of the employed workforce as establishment size increases. In all, two thirds of skill shortage vacancies are in establishments employing less than 25 people.

Table 5.9 Overall distribution of skill-shortage vacancies by sector and occupation

Column percentages

Occupations	Managers/ senior officials	Professionals	Associate Professionals	Admin/ Secretarial	Skilled trades	Personal Services	Sales & Customer service	Operatives	Elementary occupations	Total
Agriculture	*	*	*	1	1	0	0	1	5	1
Manufacturing	9	5	7	8	34	0	6	30	7	14
Construction	3	2	4	2	39	0	1	6	0	10
Wholesale, retail trade	10	1	11	12	12	*	54	7	8	12
Hotels & restaurants	3	0	0	2	4	*	7	*	46	4
Transport & communication	0	1	1	7	*	2	3	29	13	5
Finance	19	*	4	13	0	0	1	0	0	3
Business services	43	76	45	35	8	*	24	26	5	33
Public Administration	2	1	3	10	0	*	0	0	4	2
Education	0	11	3	1	*	6	1	0	2	3
Health & Social care	5	2	22	8	1	56	1	0	6	11
Other Community Services	4	*	1	2	1	35	1	0	17	5
Total	100	100	100	100	100	100	100	100	100	100
Weighted Base	7436	28886	28287	10831	31592	14889	14500	14440	8100	159081
Unweighted Base	327	1993	2036	896	1188	760	533	1077	537	9357

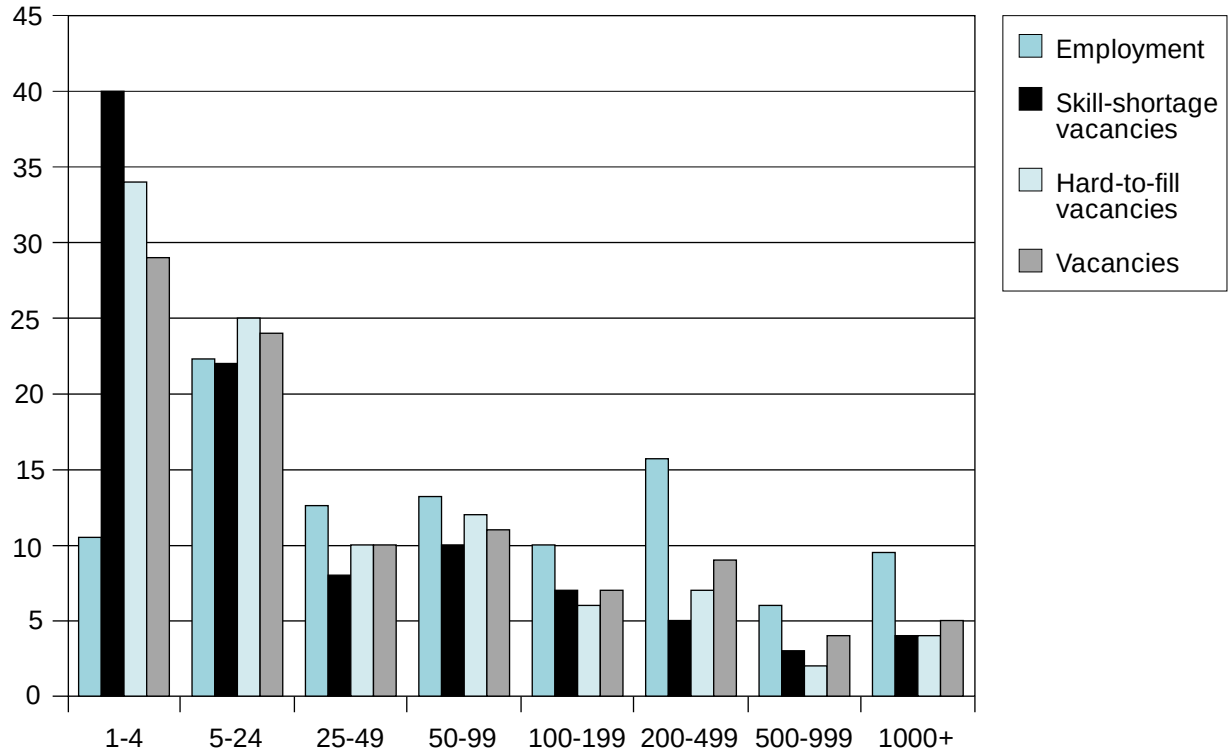
Base: All skill-shortage vacancies
Source: Hogarth et al (2001) – table 2.13a; page 27

Table 5.10 Distribution of Skill Shortage Vacancies by Establishment Size

Size	Distribution of total employment, England (%)	Distribution of skill-shortage vacancies (%)	Total Number of skill shortage vacancies	Skill shortage vacancies as a % of employment
1-4 employees	12	40	63781	3.0
5-24 employees	23	22	35653	0.8
25-49 employees	12	8	13054	0.5
50-99 employees	11	10	15710	0.6
100-199 employees	12	7	11420	0.6
200-499 employees	13	5	8293	0.3
500-999 employees	7	3	4271	0.3
1000+ employees	10	4	6900	0.4
TOTAL	100	100	159081	0.8

Source: Hogarth et al (2001); table 2.3; page 10 and Annual Business Inquiry, 1999
Base: As specified at column head

Figure 5.3 Overall distribution of vacancies and employment by size of establishment



Base: Employment, vacancies, hard-to-fill vacancies, skill-shortage vacancies
Source: Hogarth et al (2001) – figure 2.3; page 12

Skill Gaps

5.56 Throughout this section reference is made to **skill gaps**. These are defined as a divergence between an organisation's current skill levels and those which are required to meet organisational objectives. They are, therefore, internal to organisations. These gaps are measured by questions in ESS 2001 about the proficiency of current staff which produces various measures of skills gaps. The first measure is **establishment based** and provides an estimate of the total number of establishments reporting skill gaps. The second measure is **employee based** and provides an overall estimate of the number of employees who are considered less than fully proficient in their current job. (This is done by applying estimates of the proportions of employment within each occupational category regarded as less than fully proficient and summing over all occupations). Using the above establishment or employee based measures two possible indicators of skills gaps can be derived:

- **A broad definition**, that includes all establishments where 'some' of their staff lacked full proficiency (i.e. where employers reported 'nearly all', 'over half', 'some but under half' or 'very few', staff fully proficient in their job)

- A second, more **specific measure**, which includes only those establishments where a significant proportion of the workforce is reported as lacking proficiency. Here an internal skill gap is defined as existing where a lack of full proficiency (as perceived by employers) typically involved a third or more of staff in at least one occupational area, (i.e. where an employer reported 'over half', 'some but under half' or 'very few' staff were fully proficient).

Internal skill gaps reported in this section of the report are based on this second more **specific employee based measure** unless otherwise stated.

5.57 We first examine the overall level of skill gaps in the economy and the skills characteristics of these gaps. We then go on to examine the sectoral and occupational distribution of skill gaps and how these vary by establishment size, before turning to an assessment of the consequences of such gaps on organisational performance, including an indication of the occupations in which gaps are most associated with a performance impact and identification of the sectors which are most affected. As with the previous section of this chapter on skill shortage vacancies, the Employers Skills Survey 2001 (ESS) undertaken by IFF Ltd in association with IER, provides the data on which these findings are based.

Overall Level of Skill Gaps

5.58 As we have seen, 4% of establishments report that they have skill shortage vacancies. 7% of establishments have skill gaps with just 1% of establishments suffering both skill shortage vacancies and skills gaps. It can be seen, therefore, that 1 in 10 establishments suffer from either skill shortage vacancies or skill gaps and that almost twice as many establishments suffer from skill gaps as do from skill shortage vacancies.

5.59 Grossed up to the whole economy, ESS2001 reports that 1.9 million employees are not fully proficient at their jobs, and using the specific measure, 802,000 internal skill

gaps exist. Whatever the measure, skill gaps are quantitatively more prevalent than skill shortage vacancies. Comparing the data to ESS1999 we find that internal skill gaps have decreased slightly from 860,000 in 1999 to 748,000 (comparable sample) in 2001. Despite this overall decrease, the density of internal skill gaps has increased amongst elementary occupations and in the construction sector.

Sectoral Distribution of Skill Gaps

5.60 Table 5.11 shows the distribution of internal skill gaps, using the specific employee based measure, by sector. The highest number of skills gaps (around 150,000 – or 22% of the total number) are found in manufacturing establishments. The wholesale/retail and business services sectors account for a further 20% and 14% of total internal skills gaps respectively. The lowest numbers of skills gaps are found in the agriculture, construction, education and financial services sectors.

5.61 If we examine skill gaps as a proportion of employment in the sector, we can see that they impact disproportionately in the hospitality sector (5.7% of total employment); and in the manufacturing sector (4.8%) both of which have a substantially above average (3.6%) density of skills gaps. The education sector (1.4% of total employment), construction sector (2.8%) and health and social care sector (2.8%) have the lowest densities of skills gaps.

Table 5.11 Skill Gaps by Sector

Sector	Distribution of internal skills gaps	Total skill gaps as a % of total employment
Agriculture	1	3.0
Manufacturing	22	4.8
Construction	4	2.8
Wholesale & Retail	20	3.9
Hospitality	9	5.7
Transport & Communications	5	3.2
Financial Services	4	3.7
Business Services	14	3.1
Public Administration	6	3.7
Education	3	1.4
Health and Social Care	8	2.8
Other Community Services	4	3.1
All industries and services	**100**	**3.6**

Source Hogarth et al (2001) – Table 3.5A, Page 56 and Figure 3.2, page 58

Base: Employee Specific Measure

Occupational Distribution of Skill Gaps

5.62 Table 5.12 shows the occupational pattern of internal skill gaps and also decomposes the data into establishment size groups. Skill Gaps, overall, as a proportion of total employment are highest in the 'mid range' of establishment sizes – from 25 to 999 employees and are least in micro establishments employing less than 5 people. It can be seen that overall the greatest concentrations of skills gaps are in the production and process operatives occupations (16%), sales (15%), and managers and administrative / secretarial and 'other manual' occupations - (13%) in each case. Given the importance of managerial skill gaps, both in themselves, and in their indirect relationship with many other skill gaps (because of the key role of managers in decision making), it is worth noting that UK management skills are not always assessed highly by international standards (DTI 2000; Bosworth 1999; Johnson and Winterton 1999).

5.63 The International Institute for Management Development provide comparative evidence across the G7 countries of business executives perceptions of management quality. The UK ranks 5th out of 7, behind Germany, the USA, Canada and France. Johnson and Winterton conclude that UK managers are inadequately qualified compared to international competitors, a situation compounded by relatively poor levels of training and development. Bosworth found that UK managers are perceived to be poorer than their US and Japanese counterparts in every type of skill, especially in terms of their adaptability, entrepreneurial and technical skills, a situation which was more acute in smaller businesses. The best UK managers are comparable to the best in other countries, but there is a long tail where the standard is significantly poorer.

5.64 The occupational pattern of skill gaps in ES2001 varies across establishments of different size with the smallest establishments having a large skills gap in relation to administrative / secretarial occupations – this is also the case for the largest of establishments. Medium sized employers tend to experience skill gaps across a range of occupations but, generally, are associated with operatives in the larger establishments and sales/customer service occupations in the smaller establishments.

5.65 Managerial skill gaps account for a broadly consistent level of gaps across the size bands, which is a level much higher than for professional occupations (except in the very largest establishments) and associate professionals. Personal service and sales/customer services skills gaps are greatest in smaller establishments. Operative skill gaps are disproportionately great in larger establishments.

5.66 Table 5.13 presents the distribution of occupational skills gaps by size and highlights the main concentrations of occupational skill gaps. 22% of all professional occupational skill gaps fall within establishments with over 1000 workers, and over one quarter of all administrative / secretarial skill gaps are in establishments with between 1 and 24 employees. Other substantial concentrations include: 67% of personal service skill gaps being in establishments in the range of 5-99 employees; and 56% of operative skill gaps being in establishments employing between 100-999 employees.

Table 5.12 Occupational patterns of internal skill gaps by size of establishment

Column percentages

	Number of employees in establishment								
Occupation	**1-4**	**5-24**	**25-49**	**50-99**	**100-199**	**200-499**	**500-999**	**1000+**	**Total**
Occupation									
Managers/senior officials	22	14	12	9	13	12	11	15	13
Professionals	8	5	4	5	5	7	4	17	6
Associate professional	8	7	6	7	4	5	7	6	6
Administrative/ Secretarial	19	11	11	9	12	13	14	22	13
Skilled trades	9	10	10	7	7	6	9	4	8
Personal Service	13	12	15	14	8	3	7	9	10
Sales/customer service	16	20	16	16	13	15	8	9	16
Operatives	1	8	12	19	24	25	27	4	15
Elementary occupations	13	12	14	13	14	14	14	14	13
Total	100	100	100	100	100	100	100	100	100
Total skill gaps as a %									
of employment	2.2	3.8	4.3	4.7	3.9	4.4	4.4	3.3	3.9
Weighted Base	48295	175080	110748	126862	80509	141805	54843	64844	802986
Unweighted Base	253	4036	9459	10680	13898	24092	12868	16019	91305

Source: Hogarth et al (2001) – table 3.4a; page 54
Base: Internal Skill Gaps: employee based measure (where establishment employs a person in a given occupation)
Note: Percentage of all skill gaps for a particular size of establishment.

Table 5.13 Distribution of occupational skill gaps by size of establishment

Row percentages

	Number of employees in establishment											
Occupation	**1-4**	**5-24**	**25-49**	**50-99**	**100-199**	**200-499**	**500-999**	**1000+**	**Total**	**Shares of total employment %**	**Weighted Base**	**Unweighted Base**
Managers/senior officials	10	24	13	12	10	17	6	9	100	3.3	103452	11395
Professionals	7	18	9	12	9	19	5	22	100	1.9	51197	6449
Associate professional	8	24	13	18	6	14	8	9	100	2.8	47992	4787
Administrative/ Secretarial	9	19	12	11	10	18	8	14	100	3.3	103498	11255
Skilled trades	7	27	18	15	8	13	8	4	100	3.3	62597	6161
Personal Service	7	26	20	21	8	6	5	7	100	5.5	81600	9490
Sales/customer service	6	29	14	17	8	17	4	5	100	4.9	124674	11568
Operatives	0	11	11	19	16	28	12	2	100	5.7	124105	17011
Elementary occupations	3	21	15	16	11	19	7	9	100	6.1	103867	13191

Source: Hogarth et al (2001) – table 3.4b; page 55
Base: Internal Skill Gaps: employee based measure

5.67 Tables 5.14 and 5.15 display, in turn, the occupational pattern of skills gaps and then the distribution of internal skills gaps, by sector. There are some notable concentrations.

5.68 Almost half of all skill gaps in the manufacturing sector are related to production and process operative occupations. 40% of skill gaps within the financial services sector are within administrative / secretarial occupations and 26% are in sales and customer service occupations. 35% of public administration sector skills gaps are in administrative / secretarial occupations and 37% of health and social care skills gaps are in personal service occupations.

5.69 Table 5.16 shows the skill characteristics of the occupational skills gaps. It is clear that some skill characteristics are common across all occupational areas. Non-IT technical and practical skills (32%), Communication skills (40%), customer handling skills (30%), team working skills (32%) and problem solving skills (26%) feature at broadly similar levels in nearly all occupational areas. However, other skill characteristics appear more within some occupational groups than others. Basic computing skills gaps are highest amongst administrative / secretarial staff (25% of all admin/secretarial skill gaps); advanced IT skills are characteristic of skill gaps in both professional and administrative / secretarial occupations (around 35%) foreign language skills are highest amongst administrative / secretarial occupations (12%); and numeracy and literacy skill gaps are more prevalent amongst production and process operative occupations (16% each).

Table 5.14 Occupational pattern of internal skill gaps by industrial sector

Column percentages

Occupation	Agriculture	Manufacturing	Construction	Wholsale & Retail	Hotels & Restaunts	Transport & Comms	Finance	Business Services	Public Admin	Education	Health & Social Care	Other Services	All industries
Managers/senior officials	13	12	19	11	10	15	11	17	13	13	12	12	13
Professionals	3	4	7	1	2	3	12	11	16	21	7	6	6
Associate professional	1	5	3	2	1	1	6	10	12	13	16	6	6
Administrative/ Secretarial	7	8	8	7	2	11	40	21	35	15	11	12	13
Skilled trades	22	11	36	6	3	4	1	7	7	4	4	7	8
Personal Service	12	*	2	4	45	1	1	3	6	14	37	23	10
Sales/customer service	*	5	2	49	6	15	26	9	3	2	3	12	16
Operatives	8	48	9	6	1	31	1	7	2	2	1	4	15
Elementary occupations	34	7	14	13	31	19	1	15	5	14	9	19	13
Total	100	100	100	100	100	100	100	100	100	100	100	100	100
Total skill gaps as a % of employment	3.0	4.8	2.8	3.9	5.7	3.2	3.7	3.1	3.7	1.4	2.8	3.1	3.6
Weighted Base	8068	176281	31826	159538	69019	40906	35110	111203	48860	23358	62761	34022	802986
Unweighted Base	192	24154	2872	15314	8855	4693	2912	10198	6710	2301	7606	4974	91305

Source: Hogarth et al (2001) – table 3.5a; page 56
Base: Internal Skill Gaps: employee based measure

Table 5.15 Distribution of internal skill gaps by industrial sector

Row percentages

Occupation	Agriculture	Manu'ring	Const'tion	Wholsale & Retail	Hotels & Rest'nts	Transport & Comms	Finance	Business Services	Public Admin	Education	Health & Social Care	Other Services	Total	Shares of total employment	Weighted Base	Unweighted Base
Managers/senior officials	1	20	6	17	7	6	4	19	6	3	7	4	100	3.3	103452	11395
Professionals	0	15	5	4	2	2	8	24	15	11	8	4	100	1.9	51197	6449
Associate professional	0	17	2	7	2	1	4	22	13	6	20	4	100	2.8	47992	4787
Administrative/ Secretarial	1	13	2	11	2	4	14	23	16	3	7	4	100	3.3	103498	11255
Skilled trades	3	30	19	15	3	2	1	13	5	1	4	4	100	3.3	62597	6161
Personal Service	1	1	1	8	38	1	1	4	4	4	29	10	100	5.5	81600	9490
Sales/customer service	0	7	1	62	3	5	7	8	1	0	1	3	100	4.9	124674	11568
Operatives	1	68	2	8	0	10	0	6	1	0	1	1	100	5.7	124105	17011
Elementary occupations	3	12	4	20	20	8	0	16	3	3	5	6	100	6.1	103867	13191

Source: Hogarth et al (2001) – table 3.5b; page 57
Base: Internal Skill Gaps: employee based measure

Table 5.16 Skill characteristics of occupational skill gaps

Column Percentages

Skill characteristics	Occupations									
	Managers/ senior officials	Professionals	Associate Professionals	Admin/ Secretarial	Skilled trades	Personal Services	Sales & Customer service	Production & Process Operatives	Elementary occupations	Total
Basic Computing	19	15	16	25	12	8	20	16	7	16
Advanced IT	24	34	27	35	12	7	16	10	5	17
Other Technical/ Practical	23	21	40	33	42	21	28	51	24	32
Communication	47	39	41	38	29	39	43	39	37	40
Customer Handling	22	27	26	28	21	38	48	16	33	30
Team Working	39	27	26	26	29	33	28	37	32	32
Foreign Language	7	7	8	12	5	5	6	7	5	7
Problem Solving	24	33	25	27	22	19	29	34	21	26
Management	56	34	22	26	16	10	19	13	8	22
Numeracy	3	5	6	10	7	9	9	16	10	9
Literacy	2	3	6	8	5	11	9	16	10	8
Weighted Base	94091	41810	40571	89451	56965	75628	117640	115776	99330	731262
Unweighted Base	10168	4411	3676	9049	5355	8609	10699	15957	12563	80488

Source: Hogarth et al (2001) – table 3.8; page 64
Base: Internal Skill Gaps which were followed up: employee based measure

Skills Gaps and Establishment Size

5.70 Smaller establishments are much less likely to report internal skill gaps (see table 5.17). Only 3% of establishments employing under 5 staff report such gaps and 14% of those employing between 5-24 people report skill gaps. However between 20% and 26% of all establishments employing 25 or more report internal skill gaps. In terms of the scale of skill gaps, relative to total employment in establishments of a given size, the density of skill gaps is highest amongst those establishments employing between 50 and 99 people, where the gaps account for 4.7% of employment.

Table 5.17 Establishments reporting internal skills gaps by size

Number of employees	% of establishments reporting skills gaps	Total skill gaps as a % of employment
1-4	3	2.2
5-24	14	3.8
25-49	20	4.3
50-99	22	4.7
100-199	22	3.9
200-499	24	4.4
500-999	26	4.4
1000+	23	3.3
All sizes	14	3.9

Source: Hogarth et al (2001) – Tables 3.3 and 3.4a; pages 53 and 55
Base: All Establishments

Skill shortage vacancies, Skill Gaps and Organisational Performance

5.71 In this section we consider how the skill deficiencies outlined above impact on establishment performance using evidence from ESS2001 and from the econometric analysis conducted by the Institute of Employment Research on ESS1999 data (Bosworth, Davies and Wilson 2001).

Skill shortage vacancies and Organisational Performance

5.72 How does the existence of skills shortage vacancies and skill gaps affect organisational performance? An insight into the extent to which the existence of skill shortage vacancies affects organisational performance can be obtained from questions asked in ESS 2001 about the consequences of such vacancies. Thus we can begin to identify their differential impact: Which occupational skill shortage vacancies appear to impact most on performance? Which sectors are most affected, in terms of performance?

5.73 Overall, 34% of reported skill shortage vacancies led to a loss of business or a loss of orders to competitors; 50% delayed the development of new products; and a consequence of 51% of such vacancies was difficulties with customer service (see table 5.18).

5.74 It appears that certain occupational skill shortage vacancies, are more associated with negative performance impacts than others. As can be seen from the table, it seems that skill shortage vacancies in skilled trades have the greatest negative impact – both in terms of the proportion of organisations affected and the range of problems to which they give rise.

5.75 Skill shortage vacancies amongst senior officials and managers and in professional occupations also appear to give rise to serious consequences both in terms of proportion and range, too. Shortages in associate professional/technical, and in operative occupations appear to have a negative effect mostly on the development of new products and on customer services respectively.

5.76 In terms of the sectors of the economy in which skill shortage vacancies appear to have the most negative impact on performance, those most negatively affected are manufacturing, construction and finance – both in terms of the proportion of establishments affected and in the range of impacts across various measures of organisational performance. For example, in manufacturing 50% of those establishments experiencing skill shortage vacancies report a consequent loss of orders, and 59% delays most in developing new products, as a result.

Table 5.18 Impact of skill-shortage vacancies on performance by occupation

Column Percentages

	Occupations									
Impact	Senior Officials/ Managers	Professional Occupations	Associate Professionals	Admin/ Secretarial Occupations	Skilled trades	Personal Services Occupations	Sales & Customer service	Operatives	Elementary	Total
Loss of business or orders to competitors	31	23	24	18	61	30	36	35	30	34
Delays developing new products	64	52	62	38	60	50	31	29	30	50
Withdraw products	46	35	16	11	52	20	23	16	18	29
Difficulties with customer service	63	46	38	44	63	51	48	63	41	51
Difficulties with quality	25	36	25	25	37	23	27	22	35	30
Increased costs	28	53	28	38	59	19	23	37	31	39
Difficulties with technological change	32	17	15	13	43	5	10	13	5	19
Difficulties introducing new working practices	52	28	21	48	24	15	9	19	23	24
Don't know / not specified	17	7	10	16	7	17	37	17	31	14
Weighted Base	7436	28886	28287	10831	31592	14889	14500	14440	8100	159497
Unweighted Base	327	1993	2036	896	1188	760	533	1077	537	9514

Source: Hogarth et al (2001) – table 4.1; page 83
Base: All skill-shortage vacancies

5.77 There are significant negative effects in all other sectors too – perhaps most extensive in the largely public sector establishments – in public administration, education and health and social care - with, for example, in each case around a half of establishments reporting difficulties with customer services as a result of skill shortage vacancies.

Skill Gaps and Organisational Performance

5.78 We can gain an insight into the extent to which the existence of skill gaps impact on organisational performance through the questions asked in ESS 2001 on the consequences of skill gaps. Our focus here is on those establishments where fewer than 'nearly all' staff were reported as being 'fully proficient' at their jobs as, our measure of a skills gap and we seek to identify the differential impact of these skill gaps: Which occupational gaps appear to have the greatest impact on performance? Which sectors of the economy are most affected in terms of performance by the existence of these skill gaps?

5.79 The main effects of skill gaps overall are associated with difficulties in customer service, quality issues, increased costs and problems with introducing new working practices – each of these occur in more than 32% of establishments experiencing skill gaps.

5.80 Some occupational skill gaps, are more associated with various negative impacts than others, though no occupation appears to have a more extensive (in terms of types of impact) or intensive (in terms of proportion of gaps) impact on performance than others overall, except, perhaps, in operative occupations. Rather, the skills gaps in different occupations have different effects in terms of the various types of impacts experienced (see table 5.19).

Table 5.19 Impact of internal skill gaps by occupation

Column Percentages

	Occupations									
Impact	Senior Officials/ Managers	Professional Occupations	Associate Professionals	Admin/ Secretarial Occupations	Skilled trades	Personal Services Occupations	Sales & Customer service	Operatives	Elementary	Total
Loss of business/orders to competitors	22	23	16	15	20	24	38	25	26	25
Delays developing new products	30	41	38	25	22	22	14	25	18	24
Withdraw from markets	12	11	14	11	11	10	9	10	12	11
Difficulties with customer service	35	41	37	42	39	38	47	50	40	42
Difficulties with quality	33	33	41	36	35	38	35	47	41	38
Increased operating costs	34	31	33	31	37	28	29	55	35	36
Difficulties with technological change	29	25	27	35	26	16	23	31	15	25
Difficulties introducing new working practices	42	37	36	38	33	30	33	37	30	35
No particular problems	26	22	25	28	22	25	24	19	29	25
Weighted Total	94091	41810	40571	89451	56965	75628	117640	115776	99330	731262
Unweighted Base	10168	4411	3676	9049	5355	8609	10699	15957	12563	80488

Source: Hogarth et al (2001) – table 4.5; page 91
Base: All internal skills gaps that were followed up: employee based measure

5.81 Unlike with skill shortage vacancies, where there is no apparent relation between performance impact and size of establishment, the impact of reported skill gaps does appear to increase with size of establishment.

5.82 The sectors of the economy in which skill gaps appear to have the greatest negative impact on performance, are manufacturing, transport, finance and Public Administration. However, the impact varies according to the type of negative impact considered.

5.83 Overall, most sectors appear to be negatively affected in terms of the proportion of establishments affected and in the range of impacts across various measures of organisational performance. The proportions and range are both more widespread than is the case with skill shortage vacancies, but on the other hand, there are no very 'sharp' impacts in terms of a very high proportion of establishments being affected nor a particular set of problems being particularly prevalent. The only 'cell' of the matrix to exceed 50%, is the difficulty in meeting customer services in the public administration sector.

5.84 We can try to summarise the main skill shortage vacancies and gaps across a number of sectors of the economy, using the largely qualitative assessment provided by the Skill Dialogues that have been undertaken so far (several further ones are planned) and the Employer Case Studies undertaken as part of the Employer Skills research undertaken in 1999. Table 5.20 attempts to draw together, from this extensive array of evidence, the key shortages, gaps and other skill issues which have emerged from this process. This adds a qualitative dimension to the quantitative survey results we have reported on the rest of this section of the report and provides 'at a glance' the main sectoral problems as identified by senior employees working within the sector, and often informed by the dialogue process. The diversity of the shortages and gaps is apparent. However, a very broad generalisation that can be made is that there is an apparent degree of concentration in the associate professional/technical and craft skills occupational groups.

Table 5.20 Main skill shortage vacancies and Gaps by Sector

	Skill Shortages (SS)	Skill Gaps (SG)	Other Skills Related Issues
Financial Services	• Call centre staff • ICT specialist staff • Independent financial advisers: conduit of sales staff drying up • People with knowledge of new markets	• Call centre staff:-Skill retention difficulties associated with limited career development. • No qualifications framework and limited external training provision • Knowledge of Emerging Markets • Human Resource specialists	Both SS and SG are considered small relative to other sectors
Land Based Sector	• Major recruitments difficulties but more associated with low pay	• 40% have no qualifications • 275,000 require training (1 in 5 in sector) to get them to necessary NVQ3 level to cope with change • owner managers require business and management skills	
Construction	• Skilled craft jobs	• Technical and practical skills esp. in extraction/mineral processing	• Overall lack of applications especially amongst young people • Low proportion/recruitment of women and ethnic minorities
Engineering	• Craft/technician skilled operatives and esp. design engineers, electrical engineers, fitters, pattern makers, CNC programmers, setters and operators, project managers	• Technical skills • Generic skills esp. people management • Experienced designers able to manage teams	Problems especially noticeable in electronic engineering Combination of professional engineering with management skills hard to come by
ICT	• Software professionals • High level technical skills in operating systems and applications	• e-commerce/networking • generic skills	Skill shortages are beginning to diminish except in London, SE and East where they are most substantial
Transport	• Road drivers esp. goods vehicles, buses, coaches • Train drivers • Maintenance engineers (inc. aircraft) • Management skills in rail sector • Skilled technicians	• Customer service skills • ICT skills • Basic literacy, numeracy and IT in haulage drivers (imp. With increasing ICT tools)	• Skill shortages are particular in that the skills exist: people who have them are moving to other sectors/choosing to work elsewhere

	Skill Shortages (SS)	Skill Gaps (SG)	Other Skills Related Issues
Food Manufacturing	Production/Process Operatives	Ability to develop flexibility to realise efficiency gains	Operatives – but wage/condition related Literacy/Numeracy an issue for production workers
Hotels and Catering	Managers, Chefs	Basic IT skills	General operatives - but associated with wages/conditions - high labour turnover
Telecommunications	Engineers (software and hardware) Marketing	Hybrid technical and management skills Latest IT developments	Limited supply from HE sector
Local and Central Government	Policy knowledge/specialists IT Professionals/Assoc. Profs.		
Health Care	Limited current supply of physiotherapists, radiographers and other Assoc. Profs.	Managing diverse customer groups under resource pressure	Low wages in some regions causes skill retention problems
Social Care	Nurses Care workers	Literacy and Numeracy of Care Workers	

Source: - Skills Dialogues
- Employer Skill Surveys Case Studies

Training as a Response to Skills Shortages and Gaps

5.85 The further training of existing staff is one of a range of possible responses that employers may make to the existence of skills deficiencies that may manifest themselves as recruitment difficulties and/or skills gaps within the current workforce. ESS 2001 provides some information about the extent to which employers adopt such a strategy. The findings suggest that training was a response to 36 per cent of skill shortage vacancies (Hogarth et al, 2001, Table 2.23).

5.86 The use of training to address skill shortage vacancies varies somewhat by occupational group. For example, training was adopted in response to 40 per cent of skill shortage vacancies among managers and senior officers. This compares with 30 per cent of skill shortage vacancies for professional occupations (Hogarth et al, 2001, Table 2.24)

5.87 ESS 2001 also investigated the use of training as a response to internal skills gaps, and found that this is more common than is the case for skill shortage vacancies. Further training was one of the solutions to 72% of skill gaps. This figure varies somewhat by occupation from 65% in the case of elementary occupations to 80% for sales and customer service staff (Hogarth et al, 2001,Table 3.12).

5.88 One reason for the existence of skill gaps in the first place, of course, is a failure to develop/train employees. 34% of skills gaps are attributed to a failure to develop or train staff by employers – the most commonly cited cause. When employers were asked what barriers they felt prevented them from maintaining or developing a fully proficient workforce, almost a third of establishments (31%) reported a lack of time for training and 23% reported a lack of funding and a lack of cover for training respectively. It is clear that employers perceive training to be an important cause (in terms of lack of training) and solution to skill gaps, but the evidence suggests that skill gaps will continue to be experienced by employers.

5.89 It is also interesting to note that establishments who do provide training are more likley to report skill gaps in the areas in which they provide training than establishments who do not provide training. For example:

- Establishments providing training in new technology are considerably more likely to report a lack of advanced IT skills than those not providing such training (34% vs. 16%)

- Establishments providing job specific training are considerably more likely to report a lack of other technical and practical skills (38% vs. 24%)

- Establishment providing induction training are more likely to report skills shortcomings in terms of customer service skills (37% vs. 23%)

5.90 The Learning and Training at Work (LTW) survey for 2000 (IFF Research, 2001) provides a great deal of detailed information on training provision by employers, much of which is reviewed in chapter 4. The results suggest that the majority of employers feel that the skills of their current workforce are adequate, with 84 per cent saying that all or nearly all of their staff were fully proficient. However, 61% stated that the skill needs of

their employees were increasing and 17 per cent reported that they had experienced hard-to-fill vacancies in the previous 12 months (ibid. p.13).

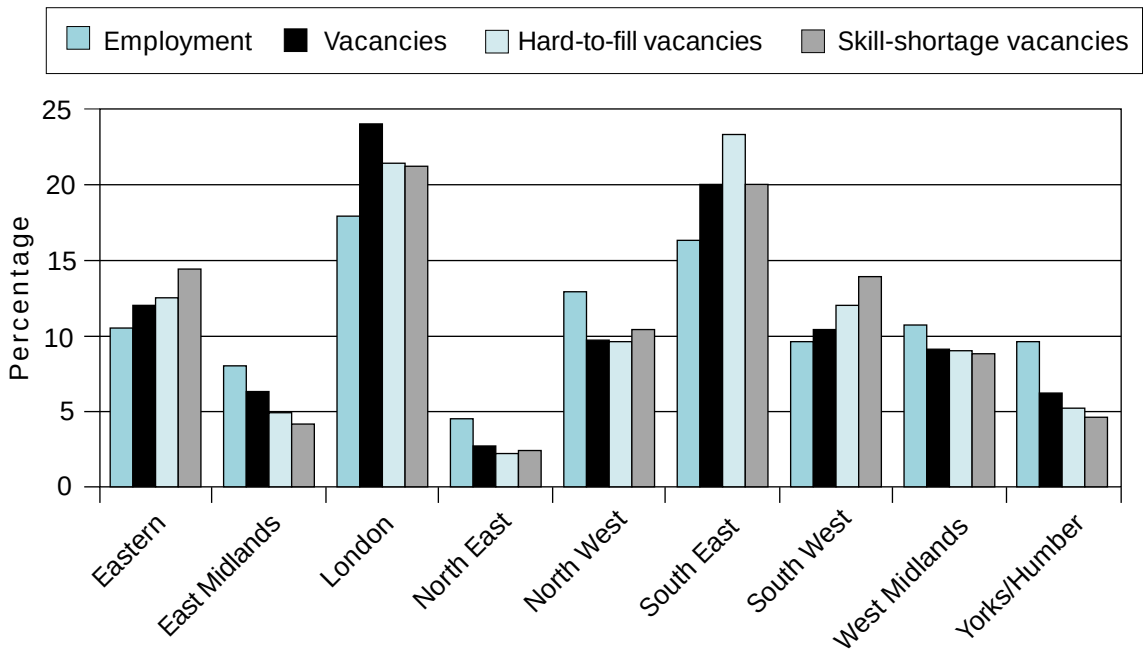
5.91 Unfortunately, the published results of the LTW survey do not present any analysis of training activity in relation to the existence of skill shortage vacancies or gaps, so at this stage it is not possible to gauge the extent to which training is being used by employers to address these issues. We are also unable, on the basis of the published results, to identify the characteristics of those employers that are not using training to respond to skill shortage vacancies or gaps. This type of information would clearly be useful in focusing public policy upon those types of employer that appear to need most assistance with addressing skills imbalances issues, though their own training activity.

Regional Variations in Skills Shortages and Skill Gaps

5.92 This section of the chapter sets out the main regional variations in skill shortage vacancies and skill gaps again drawing on ESS2001 and on ES1999 for the sub-regional analysis. Skill shortage vacancies are disproportionately concentrated, overall, in London and the South East. Figure 5.14 shows the distribution of employment, vacancies, hard-to-fill vacancies and skill shortage vacancies across the nine regions of England. It shows that four regions (Eastern, London, South East and South West) experience a greater proportion of skill shortages than their share of employment. The other five regions (East Midlands, North East, North West, West Midlands and Yorkshire and The Humber) have a lower relative proportion of skill shortage vacancies than their share of employment.

5.93 In absolute terms, the four regions with above average proportions of skill shortage vacancies (employing around 54% of the workforce) account for just under 111,000, or 70% of the total number of such vacancies.

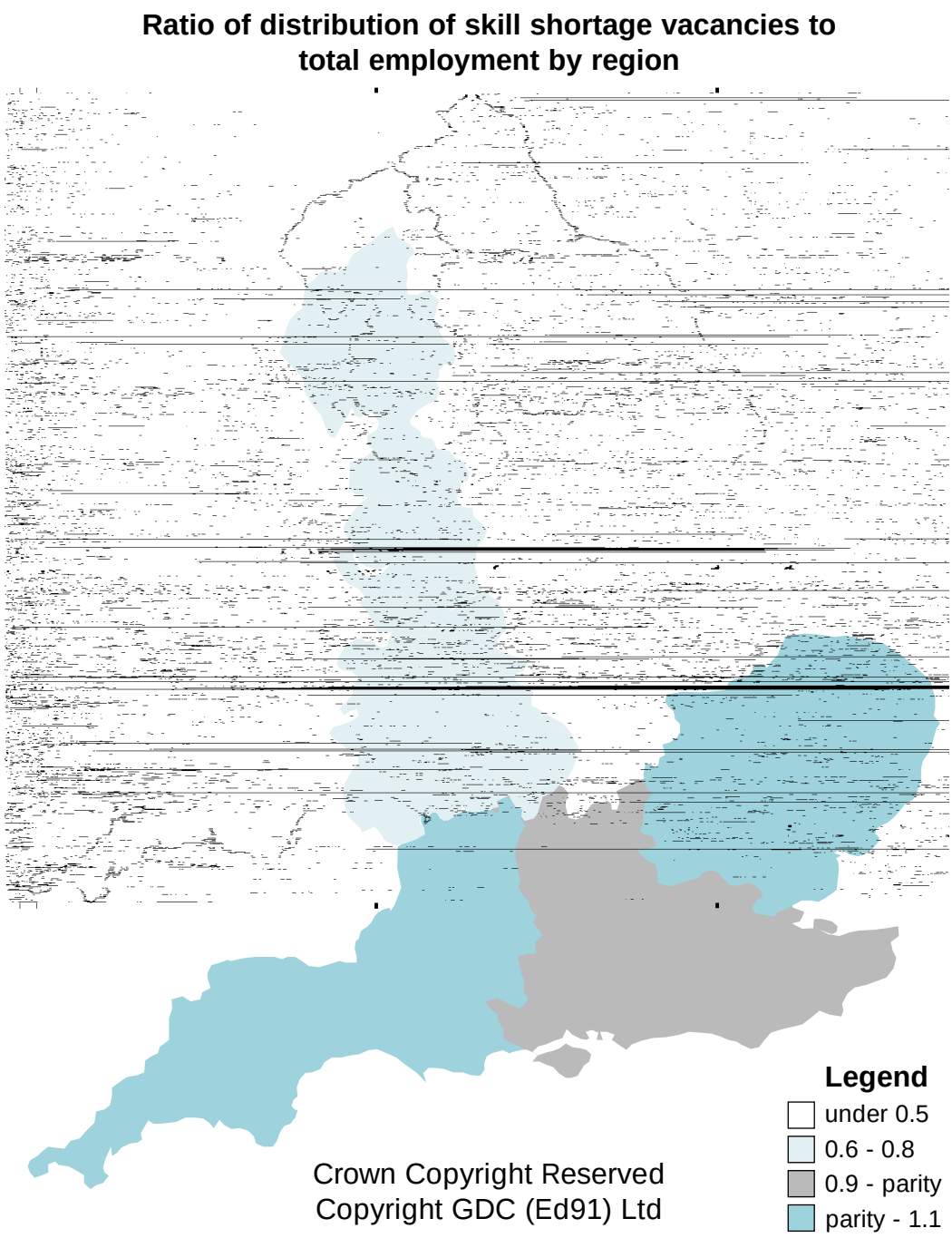
Figure 5.4 Overall distribution of vacancies, hard-to-fill vacancies and skill-shortage vacancies by RDA region



Overall distribution of vacancies, hard-to-fill vacancies and skill-shortage vacancies by region
Base: Vacancies
Source: Hogarth et al (2001), Figure 2.6, page 29

5.94 Figure 5.15 displays the ratio of skill shortage vacancies to total employment by region and clearly illustrates the north – south divide in terms of this 'density' measure of skill shortage vacancies.

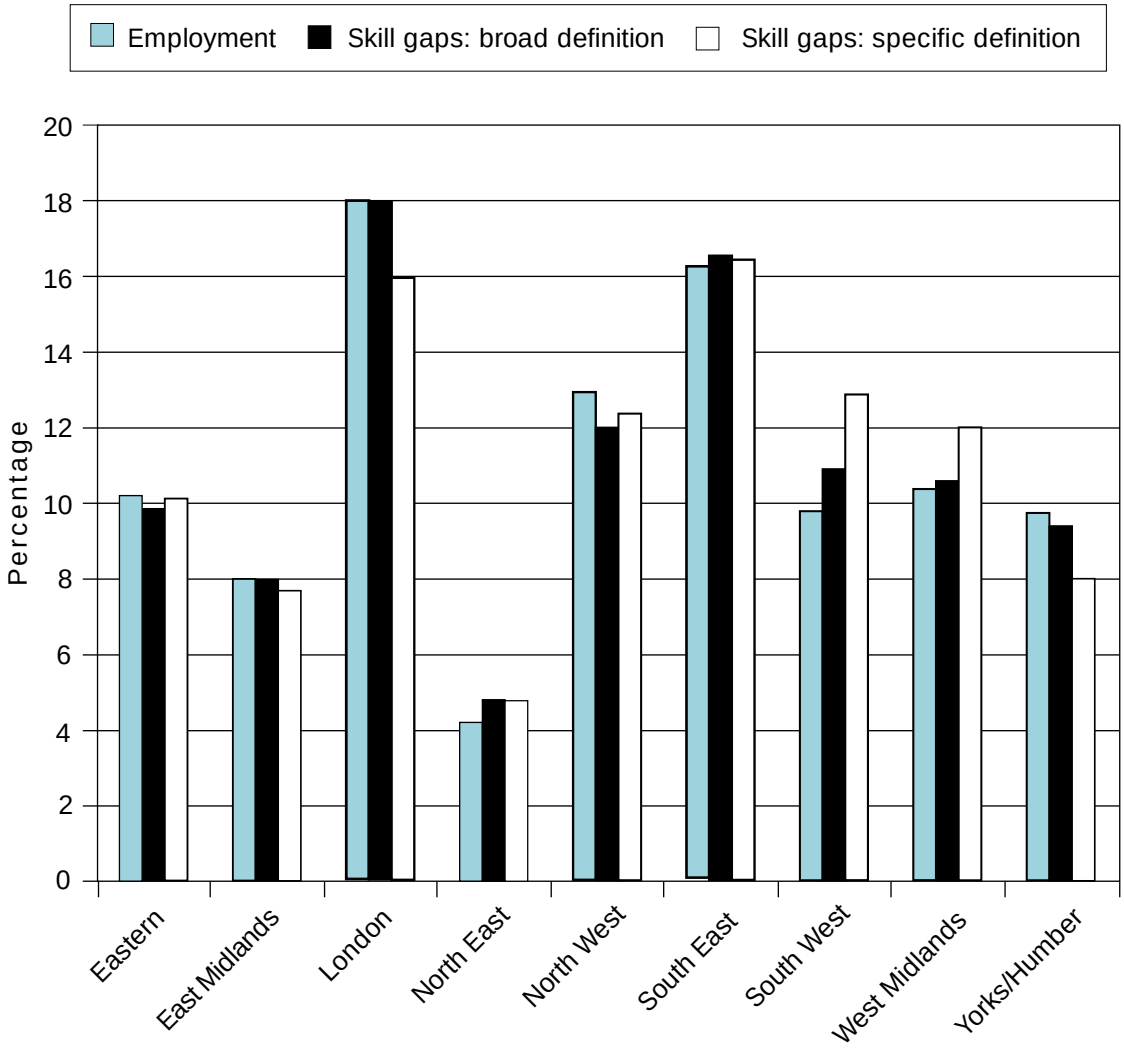
Figure 5.5 The 'Density' of skill shortage vacancies



Footnote: Score of under 1.0 indicates a disproportionately low level of skill shortages. Score over 1.0 indicates a disproportionately high concentration of skill shortages.

5.95 The distribution of skills gaps across regions broadly follows employment patterns. Figure 5.6 shows that skills gaps are most heavily concentrated in London and the South East with the North East region experiencing the lowest numbers of skills gaps. Table 5.21 indicates the density of skills gaps i.e. as a proportion of total employment. It shows that the South West experiences the highest density of skills gaps. The lowest density of skills gaps are found in Yorkshire and the Humber (3.2%).

Figure 5.6: Internal skill gaps by RDA region



Source: Hogarth et al (2001) Figure 3.3, page 59

Table 5.21 Density of internal skills gaps by region

Region	Total skill gaps as a % of employment
East Midlands	4.1
Eastern	3.6
London	3.5
North East	4.0
North West	3.7
South East	4.1
South West	5.3
West Midlands	4.2
Yorkshire and The Humber	3.2
All Regions	3.9

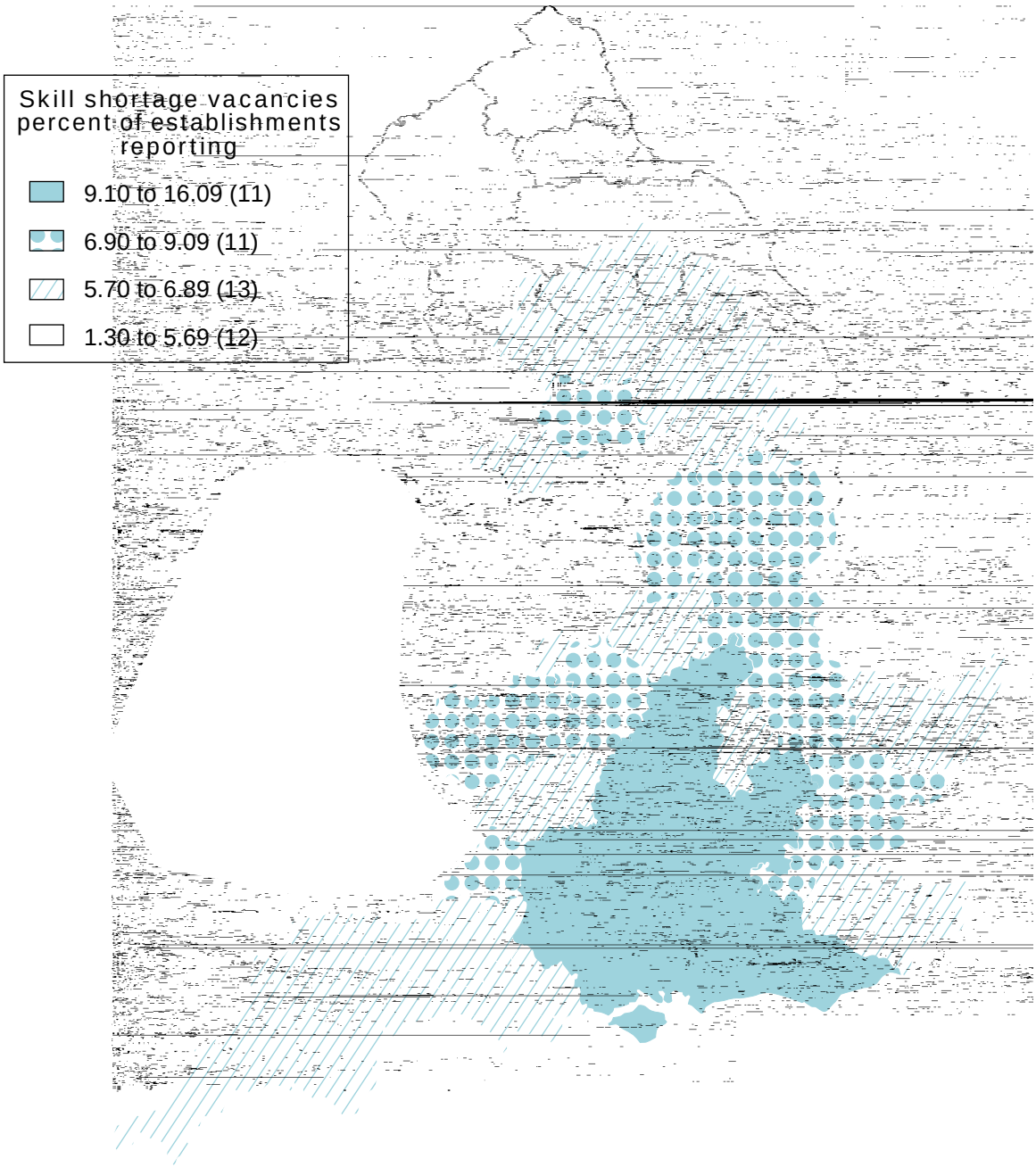
Source : Hogarth et al (2001) – Table 3.6, Page 61
Base: Internal Skill Gaps : Employee based measure

Local Variations in Skill Shortage and Gaps

5.96 It is also possible, using data from the 1999 ESS, to examine more finely geographically grained patterns of skill deficiencies and skills gaps at the level of the 47 LSC areas (Green and Owen 2001).

5.97 There is some evidence of a very broad 'North-South' divide in the existence of skill shortage vacancies (as measured by the proportion of establishments reporting one or more 'skill shortage vacancy') with the 'North' reporting a figure of 6.1% against a figure of 9.2% for the 'South'. However the variations across the 47 LSC areas are substantially greater than that across the regions as can be seen from Figure 5.17 varying from a high of 16% of establishments experiencing at least one skill shortage vacancy in West Berkshire to just 1.3% doing so in Northumberland. It is however the case that all the LSC areas with an above national average of establishments reporting skill shortage vacancies (i.e. 7.7%), are in the South or Midlands. It is also important to note that all the LSC areas in the North East region are in the quartile with the lowest proportion of establishments reporting a skill shortage vacancy.

Figure 5.7: Percentage of establishments reporting skill-shortage vacancies – LLSC areas



Source: Green and Owen (2001).

5.98 Nonetheless, intra regional differences remain substantial. For example, there are substantial differences between the high proportion of establishments reporting skill shortage vacancies in Hertfordshire and the low proportion in Norfolk – both in the East region; and there are large differences between the proportions in Coventry and Warwickshire (high) to Shropshire and Staffordshire (low) – both in the West Midlands.

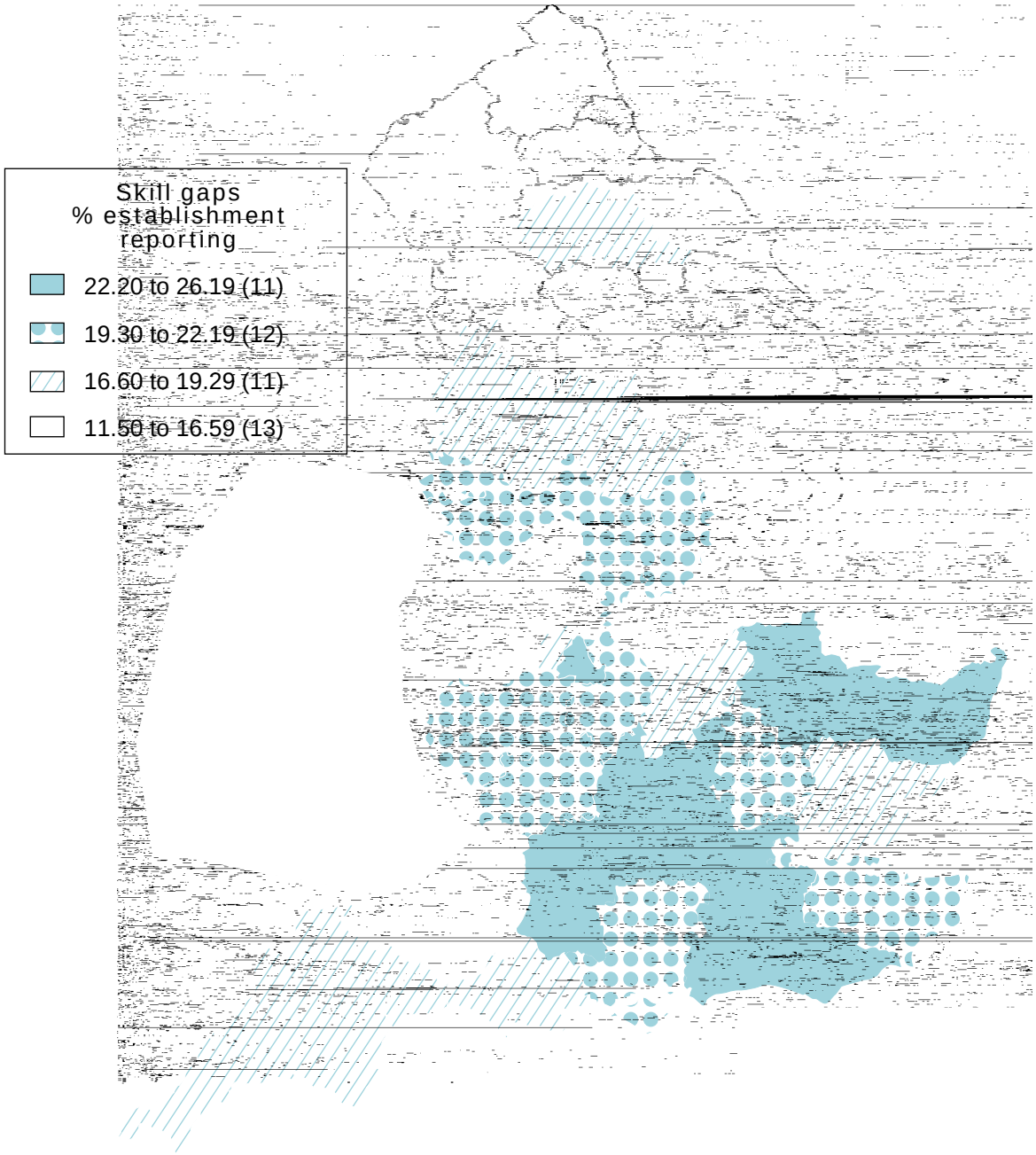
5.99 Overall there is a broadly consistent relationship between the concentration of skills shortages and areas of low unemployment (Green and Owen (2001) page 19ff), though there are some outliers, most notably in London where large parts of the region have relatively high skill shortage vacancies co-existing with of relatively high unemployment.

5.100 There is also an even more consistent relationship between the existence of skill shortage vacancies and patterns of recent employment change, with high levels of skill shortage vacancies being associated with the areas of fastest jobs growth.

5.101 The dominant types of skill shortage vacancy in most LSC areas are, in terms of occupations, (a) craft and related and (b) managerial, professional and associate professional/technical, occupations. However, the ‘dominance’ of each of these varies across LSC areas with, for example, the latter accounting for 45% of skill shortage vacancies in central London but only 12% in Humberside and 10% in Coventry and Warwickshire.

5.102 There are also substantial variations across LSC areas in the importance of skill gaps (see figure 5.8). The proportion of establishments reporting skill gaps varies from a high of 25% or more in Sussex, Cambridgeshire, West London and Bedfordshire to less than half this level in Shropshire (12%) compared to the ESS 1999 average of 20%.

Figure 5.8: Percentage of establishments reporting skill gaps – LLSC areas



Source: Green and Owen (2001)

5.103 In general the gaps appear to be greatest across large parts of the South and East. These differences remain important even when local differences in employment structure and labour market conditions are controlled for (Hogarth and Wilson 2001).

5.104 It is clear that there are important local variations in the scale of skill shortages and gaps. This has important implications for the local planning and delivery of education and training programmes, which will need to address the specific character of these deficiencies and imbalances in each locality and region.

Latent Skill Gaps

5.105 The data presented so far examines 'reported' skill shortage vacancies and skill gaps as identified by employers and management. There is, however, also evidence to suggest that some skill gaps that exist within establishments are not recognised until the organisation tries to improve its position in terms of growth or market position.

5.106 If an organisation were to 'raise its game' and begin to perform in line with the 'best' in their sector, this would reveal new skill gaps. Thus, moves to high value added production/services, expansion into new markets or shifts in their technological or organisational orientation, could uncover additional skill requirements that were necessary to enable them to achieve these changes and subsequent improvements in organisational performance.

5.107 In principle such latent skills gaps can be measured with regard to 2 main dimensions. First, the skill levels needed to achieve 'best practice' and the perceived skill deficiency when best practice is achieved. Secondly, a range of skills are required in order to move from the existing situation to a high performance position i.e. there are 'transitional' skill requirements. We can think of the sum of these 3 elements as the scale of a latent skills gap.

5.108 Moreover a skills gap in the existing workforce may actually inhibit establishments from moving in this direction and achieving improved performance. In ESS1999 a substantial proportion of establishments indicated that they would wish to improve product or service quality but were constrained from so doing by the skills currently available in their existing workforce.

5.109 Overall such latent skills gaps constrain the potential for economic growth and are therefore of considerable importance. They would provide evidence of a 'low skill equilibrium' where organisations were unaware of what is holding them back and thus not demanding the skills that are actually required to achieve enhanced organisational success. However, in practice they are difficult to measure and quantify. Nonetheless results from ESS1999 suggest the following relevant findings (Hogarth and Wilson 2001; Bosworth, Davies and Wilson 2001).

- Enterprises that adopted either a cost reduction goal or new working practices were, on average, much more likely to report higher levels of proficiency amongst their workforce. By implication, an enterprise that switched from a cost saving to a productivity goal is likely to downgrade its assessment of the proficiency of their current workforce

- Those that had adopted new technologies or new products were likely to be significantly less satisfied with the quality of their employees

- There was a positive relationship between high-level, enterprise-wide goals and those making human resource investments

- Enterprises with consistently greater emphasis on product development (covering both new products and the improvement of existing products) also made higher investments in human resource development

- The introduction of new technologies was positively linked to human resource investments

- Cost-oriented enterprises were significantly less likely to advertise vacancies, and there was some evidence that they were less likely to report hard-to-fill vacancies; profit-oriented enterprises were more likely to advertise vacancies and significantly more likely to report hard-to-fill vacancies

- Larger enterprises and, in particular, those with more than one manager, were much more likely to recognise problems of worker proficiency

5.110 Some actual estimates of the possible scale of such latent skill gaps are contained in Bosworth, Davies and Wilson (2001). If establishments who do not currently set explicit sales, cost, productivity or profits goals 'changed' so that their goals reflected those of the 'average' establishments then:

- The incidence of internal skill gaps would rise by around 2.5% points: an increase of around 10%.

- The incidence of skill shortage vacancies would increase by around 4.2% points: an increase of almost one third.

5.111 The results demonstrate the potentially significant role that latent skill gaps may play in the economy. They suggest that even fairly minor shifts from, for example, cost-reducing to product improvement amongst enterprises would produce a quite radical shift in employers' perceptions of their workforces. There is also considerable support for the hypothesis that higher rates of innovation and diffusion would also demand significant increases in skill levels. The findings suggest that latent skill gaps may be as significant as the reported ones and that there is therefore a need to make employers more aware of the importance of skills for their long-term success and to assist them in addressing these 'hidden' problems.

5.112 More generally, latent skill gaps demonstrate the importance of the 'product strategies' which employers pursue in structuring the demand for skills. Certain strategies may lead to a pattern of workforce skill requirements which are largely appropriate to their current needs but which do not provide the basis for long term enhanced competitiveness or performance through adaptation to changes in technology or the market place (NSTF 2001a). Latent skill gaps are gaps that need to be filled if England is to continue its development as a high skill, high value added economy.

Skill Deficiencies and Imbalances – International Comparisons

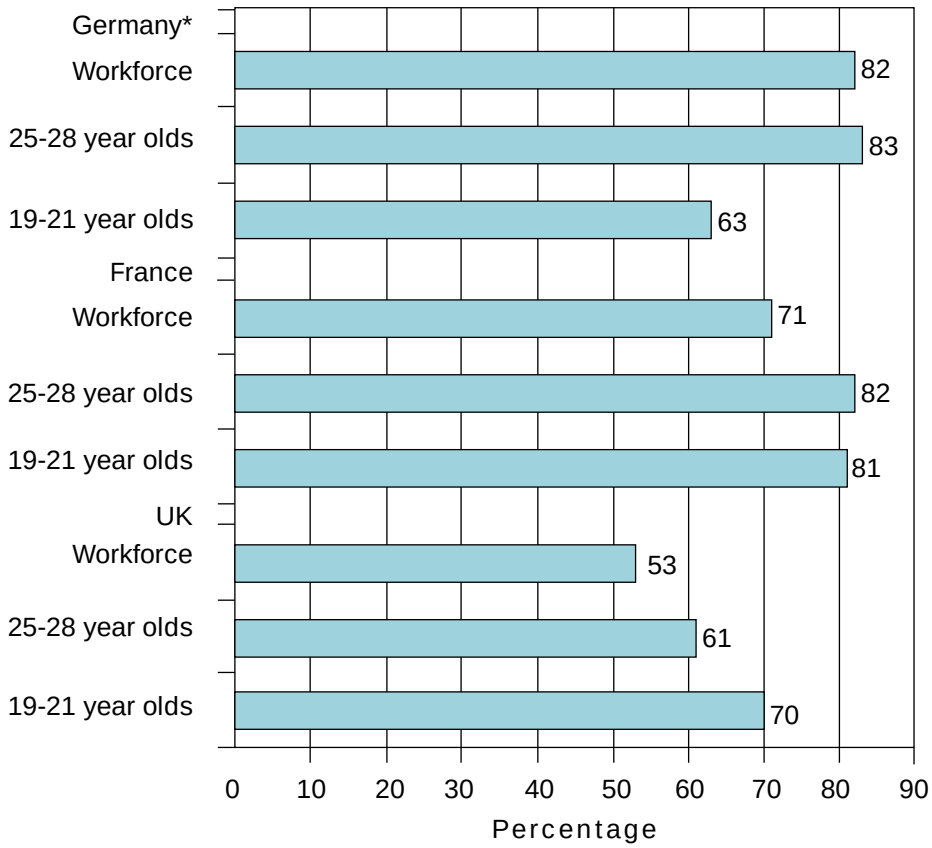
5.113 This section of the chapter provides an overview of the UKs international position on skill levels. It demonstrates that while substantial improvements have taken place in UK skill levels over recent years, the UK is not, overall, in a strong position relative to many of our competitors. However much of the actual data contained in the research reports referred to here, whilst only recently published, are largely based on data collected in 1995 in the UK e.g. the IALS Study. This needs to be borne in mind in interpreting the findings for, as we have seen, substantial progress has been made on skill levels in England since that time (see, for example, chapter 4).

5.114 The UKs overall position is not particularly strong and is possibly 'falling behind' over time with the gap between UK and other countries being greater amongst younger people than amongst older people (OECD 2001b). The proportion of adults (aged 25-64) who are qualified to upper secondary level in the UK (defined broadly as NVQ level 2 or equivalent in the UK) is 62% - exactly equal to the OECD average. Amongst older workers (aged 55-64) on the other hand, the UK is above the OECD average at 53% compared to 45%. However, amongst younger workers (aged 25-34) the proportion who have completed upper secondary level education is 66% - fully 6% points behind the OECD average. In some OECD countries such as Japan, Korea, Norway and the Czech Republic more than 90% of 25-34 year olds have completed upper secondary level education.

5.115 The skills audit, comparing qualifications at NVQ levels 2 and above and 3 and above, or equivalent, between the UK, France and Germany (Steedman 2000), shows some improvement in relative terms over the period 1994-98 (see figure 5.9 below). However, overall, the proportions of the workforce holding these levels of qualifications in the UK remain well below those in France and Germany. The exception relates to NVQ level 3 and above, where, relative to France, the proportions are broadly similar. The gap at NVQ level 2 and 3 is particularly large amongst 25-28 year olds and the gap in vocational qualifications is larger still.

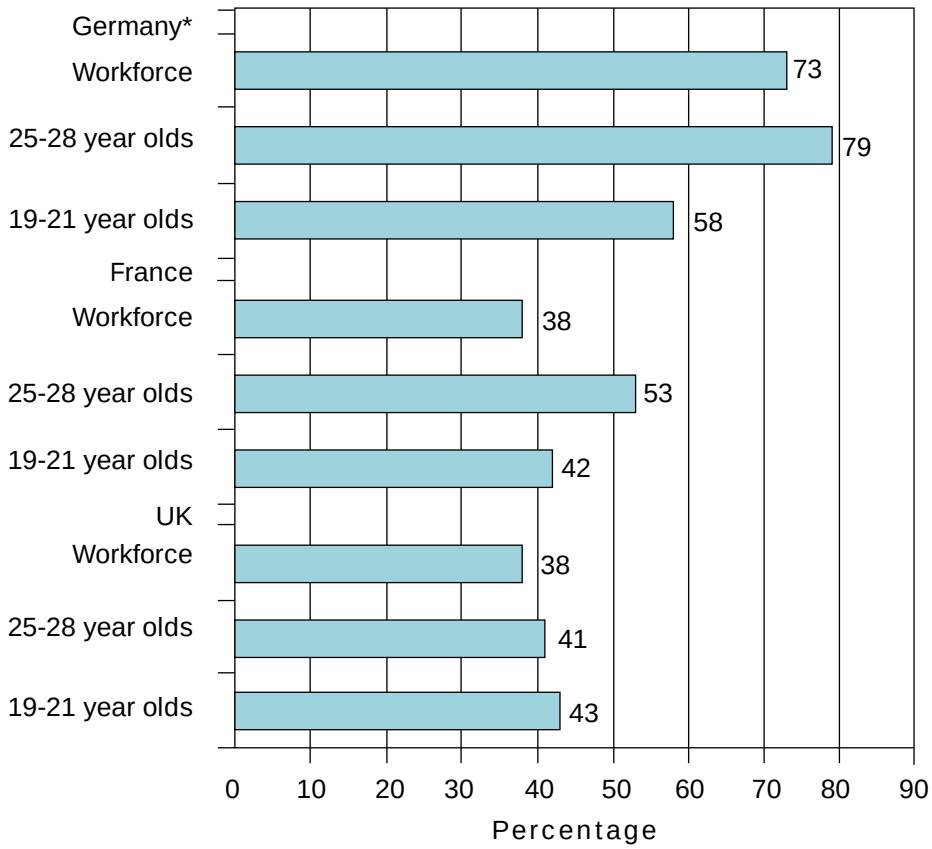
Figure 5.9: Qualifications at NVQ Level 2+, 3+ or equivalent in the UK, France and Germany

Qualifications at NVQ Level 2+ or equivalent in the UK, France and Germany



Source: Steedman in DTI 2001
*Germany data is 1997

Qualifications at NVQ Level 3+ or equivalent in the UK, France and Germany



Source: Steedman in DTI 2001
*Germany data is 1997

We now examine, in turn, performance at upper secondary and tertiary levels before turning to participation in job related education and training.

Upper Secondary Education

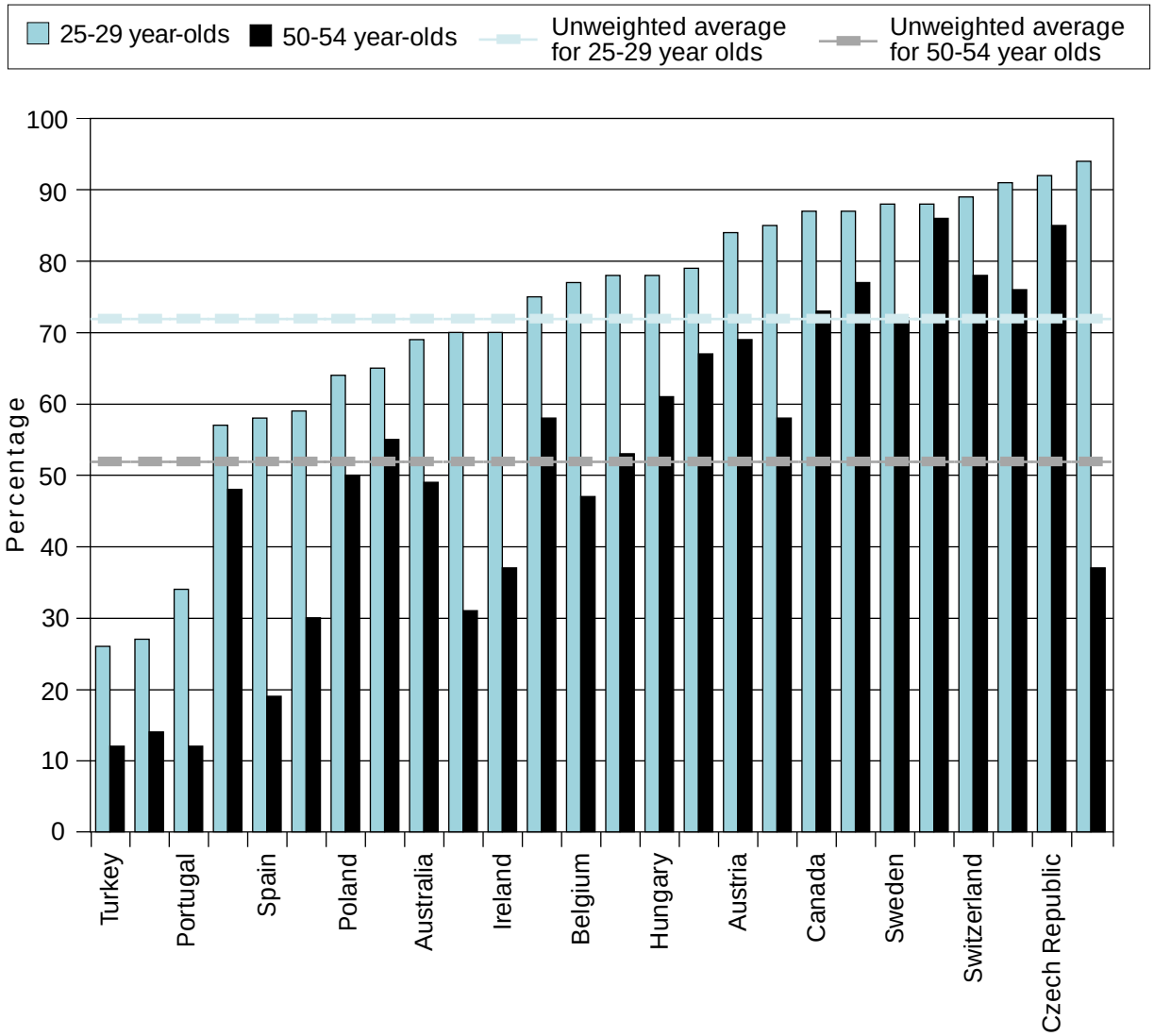
5.116 It is widely agreed that the completion of upper secondary education, through attaining NVQ 2 or broadly equivalent qualifications, is the minimum threshold for successful participation in the labour market (OECD 1998). How does the UK compare to other OECD countries on this broad indicator in relation to the proportion of young people (25-29 year olds)and older people (50-54 year olds) attaining such upper secondary level qualifications?

5.117 Survey data for 1998 (OECD 2001b), presented as figure 5.10 below, shows that for 25-29 year olds 64% have completed upper secondary level education, compared to an OECD average of 72% - thus ranking the UK 19 out of 26 OECD countries – ahead of Turkey, Mexico, Portugal, Iceland, Spain, Italy and Poland, but behind all others. This positioning, behind such major competitors as the USA, Belgium, Netherlands and Ireland, is a cause for concern. All the more so, as the measure used in the UK for these comparisons is NVQ 2 level or equivalent, which is relatively low when it is considered that the French measure includes Bac qualifications.

5.118 In the latter case of older people, 54% have completed upper secondary education compared to an OECD average of 53% - thus ranking the UK 13 out of the 26 OECD countries. So, there has been a substantial improvement over the 20/30 years since the latter group left school but:

- The improvement is less than for any other OECD country except Iceland
- The ranking for young people's performance is worse in relative terms than for older workers

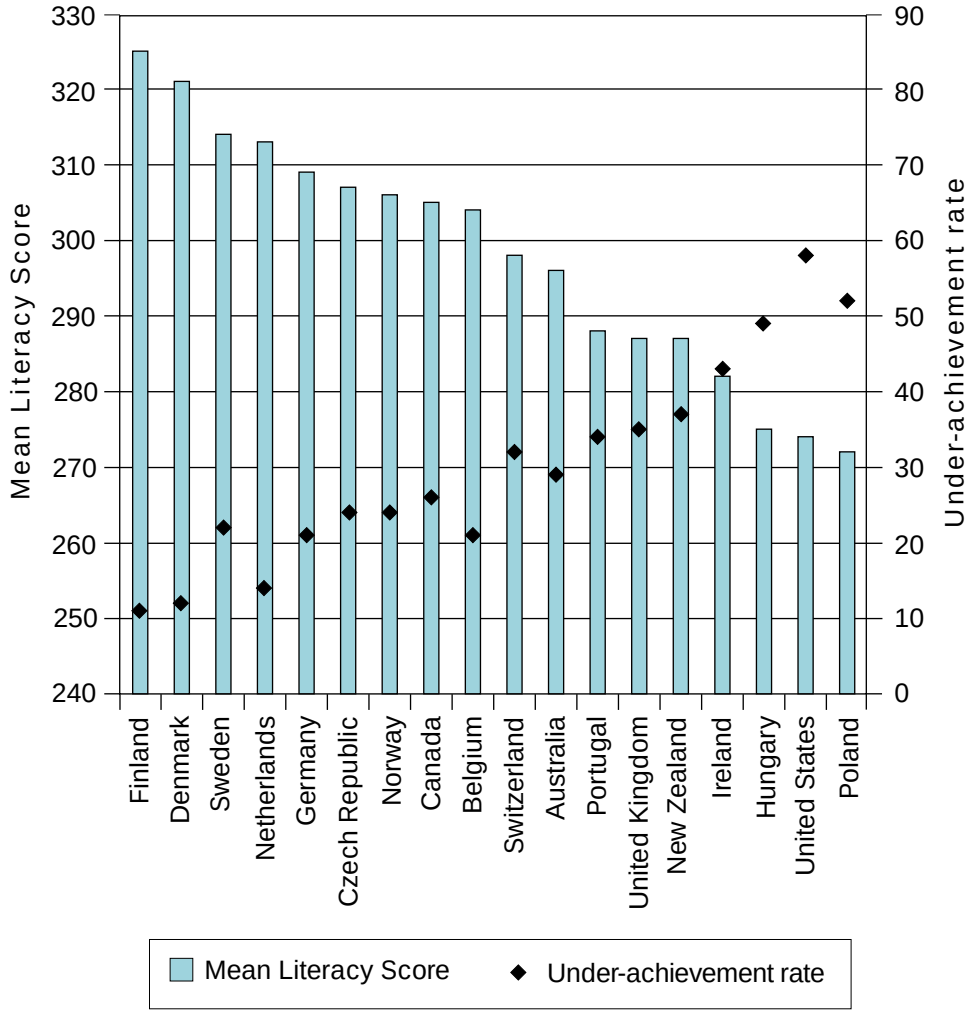
Figure 5.10
Percentages of 25-29 year olds 50-54 year olds who have completed upper secondary education



Source: OECD (20001b) Figure 2.2, page 48

5.119 A recent OECD study (OECD 2001b) uses International Adult Literacy Survey (IALS) data as a proxy measure of the 'outcomes' from such upper secondary level education amongst young people (see Figure 5.11). What is the position of the UK in terms of the literacy level of those who have completed upper secondary education (the vertical bars)? And what is the 'under achievement rate' (indicated by the circle) as measured by the proportion of those who have completed upper secondary education but whose performance in literacy is less than the minimum level of competence required to cope with every day life (i.e. IALS level 3)?

Figure 5.11: Literacy scores and 'Underacievement' across OECD countries



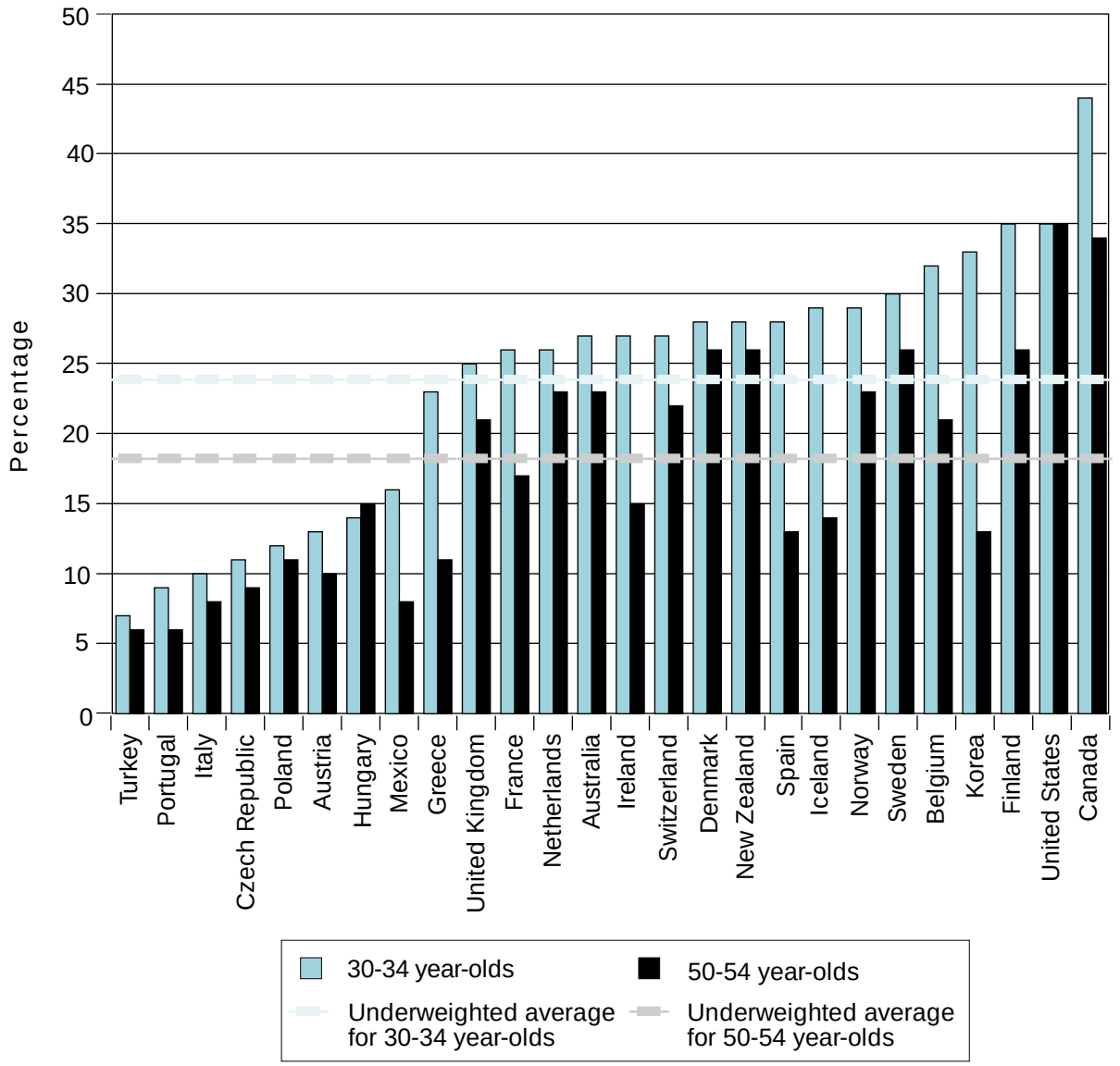
Source: OECD (2001b) page 49, figure 2.3

5.120 The UK is relatively weak on both counts. In terms of young peoples' literacy level the UK is ranked 13 out of the 18 countries. It is also relatively weak in terms of underachievement rates – again being ranked 13 out of 18. More than a third of young people, who have completed upper secondary education, fail to reach the literacy level associated with IALS level 3.

Tertiary Education

5.121 Overall, the UK has the highest rate of university graduation in the OECD at 35.6%, (of people at the typical age of graduation), just ahead of the USA, Finland and Norway. In terms of the proportion of 30-34 year olds and 50-54 year olds with tertiary level (broadly, degree level) qualifications the UK is however relatively poorly positioned in the former case and relatively well positioned in the latter case (see figure 5.12).

Figure 5.12: Proportions qualified at tertiary level across the OECD



Source: OECD (2001b) page 51, figure 2.4

5.122 In both cases the UK is (just) above the OECD average, being ranked 17th out of 26 in terms of the proportion of 30-34 year olds who have attained tertiary level qualifications and 12th out of 26 in terms of the proportion of 50-54 year olds who have attained tertiary level qualifications.

5.123 In absolute terms there is considerable progress in the UK, from 21% of 50-54 year olds holding tertiary qualifications to 25% of 30-34 year olds, but:

- The improvement is less than for most of the countries whose attainment rate for 50-54 year olds is higher than that for the UK, thus widening the gap further.

- The international ranking of younger peoples' performance is worse than for older workers

5.124 The UK however experienced a very substantial rise in enrolments in tertiary level education in the 1990s, which will feed through into the above position in future years. Indeed, between 1990 and 1997 the growth (at more than 50%) was faster than for any OECD country except Portugal (OECD 2000). Between 1989-1996 the increase in the proportion of the working age population with tertiary qualifications was the 5th highest of 19 OECD countries, behind only Canada, Belgium, Ireland and Spain (OECD 2001b, Page 162, Chart C4.2). However, the growth rate has slowed in the later part of the 1990s – for the period 1995-99 the growth had slowed to around 20%, a rate of increase which is less, for the same period, than 9 other OECD countries (OECD 2001b, Page 152, chart C3.3) - though most of these are starting from a relatively low base.

5.125 Second, the distribution of qualifications acquired through participating in tertiary education is of interest (OECD 2000, Page 174, Table C4.3a). Compared to the OECD average the UK produces, in relation to type A qualifications[1], a larger proportion of arts/humanities graduates (19% compared to 14%) but a lower proportion in social science and law (28% compared to 32%). Interestingly, the UK also produces higher proportions of graduates in computing (4% compared to 2%) and in the physical sciences (5% compared to 3%). Indeed, the UK produces the fourth highest number of science graduates per 100,000 of the young labour force (age 25-34) in the OECD (OECD 2001b, P166, Chart 4.5) The proportion of graduates in engineering, manufacturing and construction is, however, a little below the average (12% compared to 14%).

5.126 In terms of type B qualifications21, the UK produces higher proportions than the OECD average in health and welfare (35%) compared to 16% and computing (7% compared to 4%) but lower proportions in engineering, manufacturing and construction (12% compared to 16%)

Continuing Education and Training

5.127 The U.K's relative position with regard to continuing education and training is somewhat better than it is to upper secondary and tertiary level qualifications. (see figure 5.13). The overall participation rate32 amongst those aged 16-65 is 44% - the 6th highest in the OECD behind Finland, Denmark, Sweden, Norway and New Zealand (OECD 2000, Fig 2.6, page 56).

5.128 Participation in job related continuing education and training is high, relative to other OECD countries. Of the 10 countries for which comparable data are available, the UK has by far the highest participation rate – 56% of employed adults had participated over the previous year compared to an OECD average of 34% (OECD 2000, Page 201, Table C.71). On the other hand, the average actual number of hours of training that each person undertook was the second lowest. O'Connell (1999) has shown that the total training 'effort' or volume as measured by the combination of both these indicators (ie the average duration in hours per employee), puts the UK second only to New Zealand and on a similar level to the Netherlands and Ireland.

5.129 Training tends generally to reinforce already existing differences in skill attainment

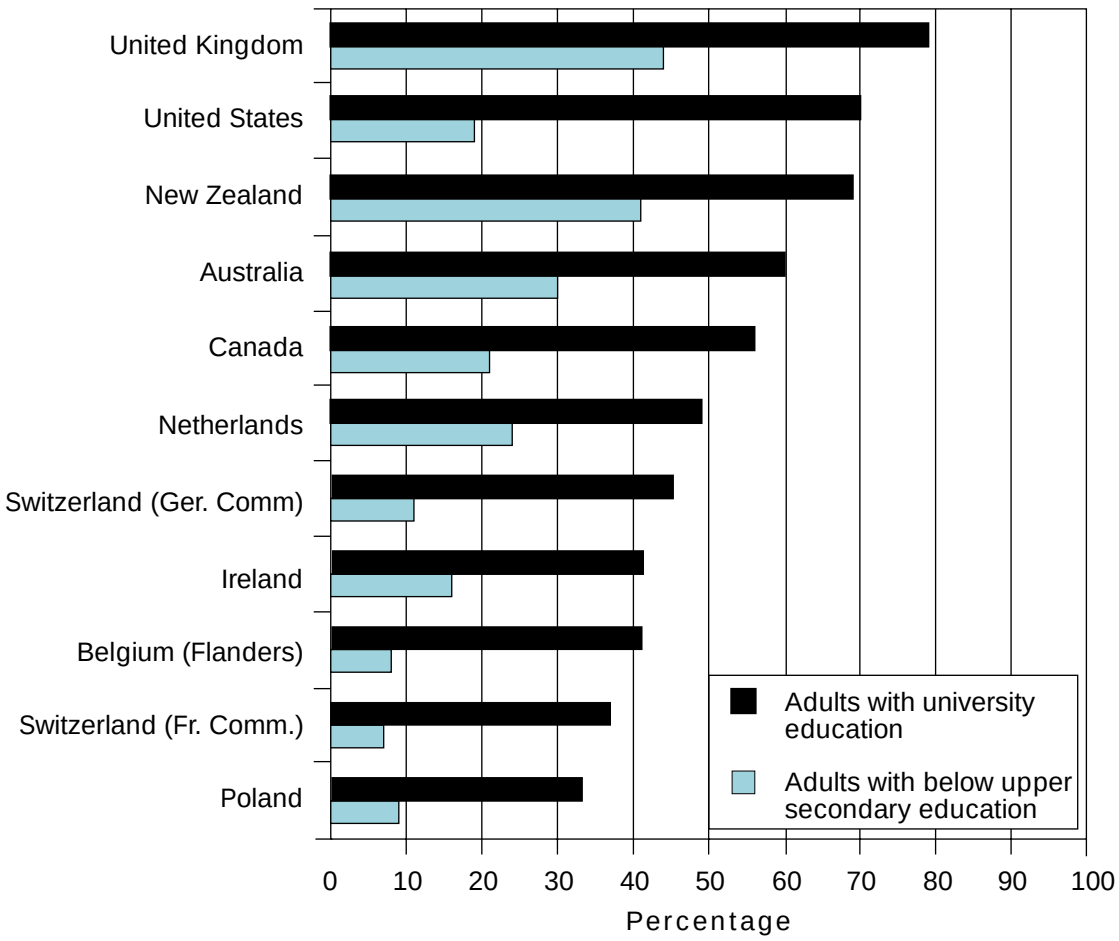
1 Type A programmes refer to largely ‘academic’ programmes, Type b to largely ‘vocational’ programmes. For a full definition and classification see OECD (2000) p151 and annex 3, table 1.

(OECD 2000, P202; OECD 2001, Page 90). Both the participation rate and mean number of hours of training per person vary by level of educational attainment, not only in the UK, but throughout the OECD countries. For example, even after controlling for employment status, company size and occupational groups, UK workers who make use of their literacy skills at work are 6 to 8 times more likely to receive support from their employers for training than those who use workplace literacy skills the least (OECD and Statistics Canada 2000).

5.130 However, in the UK this process of exacerbating existing skill inequalities, is less intensive than in most OECD countries (see figure 5.13).

5.131 Whilst it is true that the percentage of adults with below upper secondary education who participate in job related education and training is well below that for those with a University education in the UK (44% compared to 70%), both these figures are the highest in the 11 OECD countries studied. Moreover, for every age group (from 16 to 65) UK participation in job related education and training is above the OECD average (OECD 2001b, Figure 1.1, Page 144). However, this may be associated with relatively high labour turnover in the UK compared to many countries, and a consequently greater need for induction training, or with a need to undertake 'remedial' training.

Figure 5.13: Participation in job related education and training



Source: OECD (2001b) page 91, figure 3.7

5.132 The IALS study (OECD and Statistics Canada 2000) also report the relatively high levels of participation in job related education and training in the UK for those at relatively low literacy levels. The UK is ranked fourth in terms of participation for those with literacy levels 3/4/5 and sixth for those with levels 1 and 2 (see 5.135 for an explanation of these levels) - though, of course, the participation rates still vary considerably across the levels (22% at level 1, 34% at level 2, 54% at level 3 and 71% at level 4/5)

5.133 However, for those who do engage in job related education and training the intensity of it is not as great as in most other OECD countries. The average hours per trainee is, indeed, for both those with below upper secondary and for those with university education, either the second or third lowest of the 11 countries shown in Figure 5.13.

5.134 McIntosh and Steedman (2001), using the IALS data, examine the extent and intensity of training across 6 countries (France, Germany, Netherlands, Portugal, Sweden and the UK), using the IALS data, for the 'low skilled' i.e. those with qualifications below upper secondary level. While overall the UK has the second highest rate (7%) of workers receiving some sort of training in the 4 weeks prior to survey, the less well educated get less training than their more highly educated counterparts in the UK – a situation paralleled in Portugal and Sweden but not in France or Germany. Analysis of IALS data, however, shows that those with low literacy scores/levels of initial education, receive less work related training. This appears to be because they are less interested in undertaking training rather than because organisations want them to undertake less training than their more highly educated colleagues, with higher IALS scores. They hypothesise that, especially for those at IALS level 1, they don't perceive its relevance because they are generally not required to carry out tasks requiring such skills at work.

Adult Literacy and Numeracy

5.135 We now turn to international comparisons of literacy and numeracy proficiency. The IALS final report (OECD and Statistics Canada 2000) provides a comprehensive assessment of the large scale literacy study covering 23 countries over the period 1994-98. Literacy here covers a multiplicity of skills (for details see OECD/Statistics Canada (2000) Annex A) but overall the measurement of adults proficiency is measured on each of 3 domains – prose (texts); document (in different formats) and; quantitative (number). In each case ability is expressed as a score – in each case being defined as the point where a person has an 80% chance of successful performance from among the tasks included in the assessment. From the scores, 5 levels of literacy are identified:

- Level 1 – very poor skills
- Level 2 – ability to deal only with simple tasks
- Level 3 – a suitable minimum for coping with demands of every day life and work in an advanced society. Roughly equivalent to the skill level required for successful secondary school completion and college entry
- Levels 4/5 – demonstrable command of higher order information processing skills.

5.136 In terms of the average (mean) level of literacy in society the UK ranks:

- 13 out of 22 on the prose domain
- 16 out of 22 on the document domain
- 17 out of 22 on the quantitative domain
  (see OECD and Statistics Canada (2000) Figure 2.3 Pages 19ff)

Only 5 of the 23 countries (Hungary, Slovenia, Poland, Portugal and Chile) have a statistically significant lower mean proficiency on prose; 6 on document literacy (Ireland, Hungary, Slovenia, Poland, Portugal and Chile); and 4 on the quantitative scale (Slovenia, Poland, Portugal and Chile). A recent international survey of maths and science performance amongst young people (age 14) across 38 countries provides a picture of the UK's relative position on maths proficiency (Ruddock (2000). Overall, performance in the UK is around the international average for maths, but above it in science. However performance in neither improved significantly over the 1995-9 period. Compared to 11 other key countries (OECD (2001a) Page 309) the UK ranks tenth out of 12 on maths performance, but seventh out of 12 on science.

5.137 Fourteen of the countries (including the UK) have at least 15% of 16-25 year olds performing only at literacy level 1 – the UK figure is 22% or 23% depending on whether we are dealing with the prose, document or quantitative domains – on average about the sixth worst in terms of proportion in the OECD study. However the UK has a relatively high proportion scoring at level 5. This is clear evidence of a strong 'polarization' of skill levels.

5.138 The key factors associated with literacy proficiency include (see OECD and Statistics Canada (2000) Table 3.21 Page 165):

- Educational level – but this does not guarantee the relevant literacy level, nor is it a necessary condition for it. In the UK, 35% of those who have not completed upper secondary education scored at level 3 or above, whereas in Sweden, 60% did so.
- Native versus foreign language - comparing the percentage at only level 1 literacy between native born and second language/foreign born, the proportions are 22% and 54% respectively (Table 3.18 Page 160)
- Occupation – people's work experience and job position. It is interesting to note (Table 4.6 Page 168-171) that the occupational category in which the UK has, comparatively, the worst position in terms of the proportion of people at literacy level 3 or above, is craft/machine workers (blue collar workers). At just 38% this is lower than in all 14 countries that were so compared – except for the USA and Canada.
- Labour Force participation and participation in voluntary activities – whether people are in employment and/or participate in voluntary work.

Much less significant variables are gender, age, parents' education and the sector of the economy in which people work.

Key Findings

Wage Differentials and Rates of Return

- Using changes in wage differentials as an indicator of skill imbalances demonstrates that, managerial, professional and associate professional occupations are the groups which have experienced the largest relative increases in earnings over the last 25 years. The smallest increases, for males, have been in clerical; skilled construction/related trades; personal service occupations; other sales occupations; unskilled manual occupations; and, to an extent, teaching professionals and health associate professionals. The range of occupations where relative wage increases have been low for women are much fewer but are mainly clerical, personal service, other sales and unskilled manual workers.

- Over the shorter term, and in terms of a more detailed occupational breakdown, managers have seen the largest relative increases in earnings amongst men and women, with health professionals (male) and legal professional, sales and hairdressers (female) also experiencing significant increases.

- Assessing the relative rates of return to different levels and types of qualifications shows high rates of return for level 2, 3 and 4 academic qualifications for both men and women with, perhaps, particularly high rates of return on first degrees, though with a high degree of variance. Returns to vocational qualifications at level 3 tend to be lower than for academic qualifications at this level, though if account is taken of the differing lengths of time required to obtain the qualifications, the rates of return are comparable. The returns to vocational qualifications below level 3, however, are low – though not for those with limited prior ability. The highest rates of return, however, are for those acquiring professional qualifications. There is also evidence of high rates of return to acquiring both literacy and numeracy skills.

Qualifications and Occupations of the Unemployed/Inactive

- Examining the qualifications and previous occupations of the unemployed and economically inactive relative to those who are in employment, provides an insight into skill imbalances. Overall, those not in work are less likely to have higher level qualifications and more likely to possess low or no qualifications. Skill ‘surpluses’ (i.e. those in excess supply) appear to be greatest at the levels of no and level 2 qualifications. Those not in work are also less likely to have been employed in managerial and professional occupations and more likely to have been employed in craft and plant/machine operative occupations. Skill surpluses appear to be greatest in these last two occupations and, to a lesser extent, in personal/protective service occupations. Skill surpluses appear to be increasing most in sales; personal and protective occupations; and in unskilled manual occupations, though they appear to be falling in craft occupations.

- Assessing the extent to which the supply of more qualified people are actually employed and the extent to which their qualifications are actually required, provide indications of the existence or otherwise of whether the skills supplied are actually needed. Evidence is provided elsewhere in the report of relevance to this issue

but an examination here of the relation between the demand for, and supply of, highly qualified people across the OECD shows that demand is indeed rising faster than supply – and especially so in the U.K. Moreover, a study of the necessity of qualifications as perceived by workers has shown that, overall, the qualifications required in recruitment were actually required to do the job effectively, though this varied across levels of qualification.

Skill deficiencies

- ❑ The overall balance between skills demand and supply is likely to tighten further in the coming years

- ❑ One in 25 of all employers report the existence of skill shortage vacancies and the total number of skill shortage vacancies is around 159,000. One third of skill shortage vacancies take over 6 months to fill.

- ❑ The nature and distribution of the shortages varies markedly by size of establishment, by sector, occupation and location, thus disproportionately affecting some parts of the economy and labour market more than others.

- ❑ Skill shortage vacancies disproportionately occur in very small establishments - 40% of all skill shortage vacancies arise in establishments employing less than 5 people. Indeed skill shortage vacancies represent a decreasing proportion of those employed as size increases.

- ❑ The main skills sought in connection with skill shortage vacancies are; technical/practical skills other than IT; advanced IT skills; customer handling skills; communication skills; and team working skills.

- ❑ Skill shortage vacancies are disproportionately concentrated in the manufacturing, construction, wholesale/retail and health/social care and, especially, business services sectors of the economy. However, the last year has seen a large reduction in shortages in the construction sector and an increase in shortages in public administration, in health and social care and in business services.

- ❑ The occupational distribution of the shortages varies markedly across the sectors eg in manufacturing they disproportionately relate to skilled trade and production process operators whereas within business services they relate mainly to professional and associate professional occupations.

- ❑ Skill shortage vacancies occur across the full range of occupational groups though just 3 groups account for well over half of all such vacancies - professional; associate professional; and craft occupations. They are least prevalent amongst managers and administrative/secretarial occupations.

- ❑ The most sought after skills in each of the main skill shortage occupational groups are: professional occupations - advanced IT skills (51% of all skills sought in skill shortage vacancies); associate professional occupations - advanced IT skills (41% of all skills shortage vacancies); in craft occupations - technical/practical skills (64% of all skills shortage vacancies).

Skill Gaps

- There are around 1.9 million people who are not fully proficient in their jobs according to employers. On a definition where 'over half' or fewer employees are fully proficient in their jobs, there are around 803,000 skill gaps. On both measures used, there are small reductions from the 1999 figures, reductions that apply to all sizes of establishment and all sectors of the economy.

- On a definition where 'a third or more staff in at least one occupational area' is not fully proficient in their job, 7% of establishments report the existence of a skills gap. Whatever the measure used, skill gaps are clearly quantitatively more important then skill shortage vacancies.

- The main skill gaps in terms of the skill characteristics which are lacking are: communication skills; non-IT technical/practical skills; team working; customer handling; and problem solving skills. IT skill characteristics (basic and advanced taken together) also feature prominently.

- Skill gaps affect some sectors more than others. The most affected sectors are manufacturing (which accounts for nearly one quarter of all skill gaps) and hospitality, as well as wholesale/retail, financial services and public administration. Skill gaps are least in education. The occupational distribution of the gaps varies with nearly half of skill gaps in manufacturing relating to production/process operators and around 40% of skill gaps in both financial services and public administration being in administrative/secretarial occupations. Nearly 40% of health and social care skill gaps are in personal service occupations.

- In occupational terms the largest skill gaps are in managers, production and process operators, sales, 'other' manual, and administrative/secretarial occupations. Some skill characteristics of the gaps are common across occupational groups, most notably: non-IT technical and practical skills; communication skills; customer handling; and team working skills. In other cases, some skill characteristics appear more in certain occupational groups eg basic computing in administrative/secretarial or numeracy and literacy amongst production/process operatives.

- Small establishments are much less likely to report internal skill gaps. Between 20% and a quarter of all establishments employing 25 or more people, report an internal skills gap.

- Training is utilised by organisations to tackle skill shortage vacancies and gaps - by around a third of establishments in the former case and by around three-quarters in the latter case. However the use of training, in this regard, varies substantially by occupational group.

- One important cause of skill gaps is a failure to train staff in the first place.

Skill Deficiencies and Organisational Performance

- Skill deficiencies affect organisational performance in a range of ways - loss of business; loss of orders to competitors; delays in developing new products; difficulties with customer services and so on. The sectors most negatively affected, in terms of the proportion of establishments affected and in terms of the range of impacts across various measures of organisational performance, by shortages are in the manufacturing and finance sectors. Also strongly affected are public sector organisations.

- It also appears that certain occupational skill deficiencies are more associated with negative performance impacts than others. The most serious impacts - in terms, again, of the proportion of organisations affected and the range of problems to which they give rise - are in skilled trades; managers; and in professional occupations.

- Skill gaps affect organisational performance in a range of ways - customer service, quality, costs and new working practices in particular. Most sectors appear to be negatively affected, in terms of the proportion of establishments affected and the range of impacts across various measures of organisational performance, but there appear to be few 'sharp' impacts - only one cell of the impact types/sector matrix exceeds 50% (ie of establishments affected in this way) - the difficulty of meeting customer services in the public administration sector.

Regional and Local Variations in Skill Deficiencies

- Skill deficiencies overall are predominantly concentrated in London and the South East with the South West and Eastern regions also experiencing a disproportionate share. Together these 4 regions account for 70% of skill shortage vacancies compared to only 54% of employment.

- The distribution of skill gaps more broadly mirrors the distribution of employment. Skill gaps are most heavily concentrated in London and the South East, with the North East experiencing, by some margin, the lowest number of skill gaps. However, as a proportion of employment the gaps are also relatively large in the South West and West Midlands.

- An examination of the pattern of skill shortages reported in ESS 1999 at the level of the 47 LSC areas, displays a general North-South divide. However the scale of the variations across the localities is substantially greater than that across the regions with, for example, the proportion of establishments experiencing at least one skill shortage vacancy varying from just over 1% to 16%. Moreover, the types of skill shortage vacancy vary substantially across different LSC areas. There is also a strong relationship between the geographic concentration of skill shortages and, both areas of low unemployment and, especially, fast jobs growth.

- There are also large variations in the scale of skill gaps across the LSC areas from a high of 25% to less than half this level. In general the gaps are greatest in large parts of the South and East of England.

Latent Skill Gaps

- There is evidence to suggest that there may be deficiencies in the skills required to compete effectively in rapidly changing markets, though such gaps tend to appear when organisations seek to improve their competitive position. Such evidence is consistent with the possibility of a 'low skills equilibrium'

- Latest skill gaps are difficult to measure and quantify though the survey results are suggestive of their likely scale and significance and preliminary econometrics evidence implies that they may potentially increase the scale of internal skill gaps by as much as 10% and the scale of skill shortage vacancies by as much as a third

International Comparisons

- The U.K.'s overall position in terms of workforce qualifications is around the OECD average, although in relative terms and over the long term, this position appears to be deteriorating. However, the position varies across different qualification levels and indicators.

- In terms of upper secondary education levels (NVQ2 or equivalent), whilst in historical terms qualifications levels have increased considerably, the improvement is less than in nearly all other OECD countries. Moreover, in comparative terms, the performance of younger people is weaker than that for older people – the U.K. is ranked 19 out of 26 in the former case and 13th in the latter case.

- The literacy levels and achievement rates of young people achieving upper secondary education levels are both comparatively modest, placing the U.K. 13th out of 18 OECD countries in both cases.

- In terms of tertiary education, the UK has the highest rate of university graduation within OECD. Whilst in historical terms qualification levels have increased substantially, the improvement is less than in most OECD countries. Moreover, in comparative terms, the performance of younger people is weaker than that for older people – the U.K. is ranked 17th out of 26 in the former case and 12th in the latter case.

- The type of qualifications obtained through tertiary education in the U.K. is, in some ways, different from that in the OECD as a whole, producing higher proportions of arts/humanities, health/welfare, computing and physical science 'graduates' but lower proportions in the social sciences and law and in engineering/manufacturing and construction.

- As far as continuing education and training is concerned, the comparative position of the U.K. is relatively strong. Participation rates in job related education and training are amongst the highest in the OECD. On the other hand, the actual amount of time that each participant spends training (training intensity) is very low in comparative terms. In terms of the overall training 'effort', i.e. the 2 measures combined, the UK is placed second only to New Zealand.

- The distribution of training activity generally reinforces existing differences in skill levels both in terms of participation rates and volume of training. However, in the U.K. this process exacerbates initial differences less dramatically than in most other OECD countries. In relative terms, therefore, participation is high at lower skill levels, though substantial differences in participation between different skill levels are still experienced. Not all of these differences are associated with employer behaviour as it appears that overall the less well qualified are also less interested in undertaking training than their more highly qualified counterparts.

- Adult literacy and numeracy in an increasingly information based society is of considerable importance. The International Adult Literacy Survey (IALS) demonstrates that the UK ranking on average literacy levels varies, according to the domain measured, from 13th to 17th out of 22 OECD countries, a result very similar to that provided by the proportion of the adult population of working age at level 3 literacy or above (i.e. the widely agreed minimum to cope with the demands of every day life in work in an advanced society). The UK's ranking is especially weak amongst craft and other manual workers.

- The proportion of the adult population of working age who are proficient only at the lowest level – level 1 – is between 22% and 23%, around the 6th highest level in the OECD study. However, the proportion proficient at level 5 is relatively high. This is evidence of a ‘skills polarisation’ in the UK.

ANNEX 5.1
Average gross weekly earnings of males in Great Britain in 1995 and 2000

SOC 1990	Male average gross weekly earnings*		
	1995	2000	Percentage Change - 1995 to 2000
General Managers/Administrators	700.7	952.2	35.9
Specialist Managers	638.4	825.3	29.3
Woodworking Trades	274.4	352.6	28.5
Health Professionals	732.1	922.9	26.1
Security/Protective Service Occupations	352.7	441.4	25.1
Production Managers:Manuf,Cons, etc	510.5	636.2	24.6
Sales Assistants/Check-out Operators	199.8	248.9	24.6
Professional Occupations nec	314.2	390.9	24.4
Business/Financial Professionals	558.4	694.0	24.3
Sales Representatives	372.3	455.4	22.3
Other Occupations:Sales/Services	198.2	242.1	22.1
Protective Service Officers	583.8	712.9	22.1
Other Transport/Machinery Operatives	322.0	392.5	21.9
Legal Professionals	662.8	806.5	21.7
Construction Trades	277.0	336.2	21.4
Managers:Farming, Forestry/Fishing	328.9	398.9	21.3
Health Associate Professionals	358.4	434.5	21.2
Scientific technicians	352.2	426.9	21.2
Other Occupations:Construction	273.3	330.9	21.1
Electrical/Electronic Trades	354.8	429.2	21.0
Plant/Machine Operatives nec	316.5	382.3	20.8
Computer Analyst/Programmers	449.4	542.8	20.8
Assemblers/Lineworkers	282.7	339.7	20.2
Metal Working Process Operatives	292.9	351.8	20.1
Engineers/Technologists	481.3	577.8	20.0
Vehicle Trades	285.0	341.2	19.7
Other Occupations:Communication	287.1	343.7	19.7
Managers/Administrators nec	533.4	633.3	18.7
Road Transport Operatives	271.5	322.2	18.7
Draughtspersons,Quantity/other Surveyors	380.5	451.4	18.6
Managers/Proprietors:Service Industries	382.2	453.3	18.6
Textiles/Tannery Process Operatives	256.5	304.0	18.5
Catering Occupations	209.5	247.4	18.1
Health/Related Occupations	243.2	286.9	18.0
Metal Forming, Welding/Related Trades	330.2	389.4	17.9
Literary, Artistic/Sports Professionals	465.2	548.2	17.8
Managers:Transport/Storing	413.1	486.8	17.8
Metal Machining,etc/Instrument Trades	357.7	420.9	17.7
Personal/Protective Service nec	230.3	270.1	17.3
Buyers, Brokers/Related Agents	398.5	467.0	17.2
Other Occupations:Transport	268.4	313.8	16.9
Other Craft/Related Occupations nec	258.4	301.7	16.8

Average gross weekly earnings of males in Great Britain in 1995 and 2000 continued

SOC 1990	Male average gross weekly earnings*		
	1995	2000	Percentage Change - 1995 to 2000
Architects, Town Planners/Surveyors	460.8	537.2	16.6
Chemicals, Plastics/Related Process	324.7	378.4	16.5
Teaching Professionals	482.9	562.6	16.5
Associate Professional/Technical nec	379.1	440.6	16.2
Food, Drink/Tobacco Process Operatives	283.6	328.4	15.8
Other Occupations:Agric/Forestry/Fishing	235.4	272.2	15.6
Stores/Despatch Clerks, Storekeepers	254.0	293.3	15.5
Clerks (not otherwise specified)	255.5	293.8	15.0
Metal Making/Treating Process Operatives	332.1	381.2	14.8
Textiles, Garments/Related Trades	255.4	292.6	14.6
Printing/Related Trades	343.6	393.0	14.4
Food Preparation Trades	231.7	264.0	13.9
Business/Financial Associate Profs	642.3	730.7	13.8
Other Occupations nec	234.1	265.3	13.3
Natural Scientists	492.6	556.3	12.9
Filing/Records Clerks	286.1	321.0	12.2
Domestic Staff/Related Occupations	223.3	250.5	12.2
Administrative/Clerical Officers/etc	243.2	271.6	11.7
Numerical Clerks/Cashiers	297.4	328.6	10.5
Social Welfare Associate Professionals	318.1	351.0	10.3
Travel Attendants/Related Occupations	333.2	367.0	10.1
Other Occupations:Mining/Manufacturing	273.1	300.2	9.9
Other Routine Process Operatives	280.9	308.5	9.8
Financial Institution/Office Managers	519.8	570.3	9.7
Clerical/Secretarial Occupations nec	326.6	353.0	8.1
Receptionists, Telephonists/Related	305.5	327.5	7.2
Secretaries, Personal Assistants, etc	-	301.9	-
Childcare/Related Occupations	-	225.4	-
Mobile, Market/Door-to-door Salespersons	-	300.7	-
Sales Occupations nec	-	331.2	-
All occupations	374.6	453.3	21.0

Source: New Earnings Survey 1995 and 2000
*those whose pay was affected by absence are excluded

Annex 5.2
Average gross weekly earnings of females in Great Britain in 1995 and 2000

SOC 1990	Female average gross weekly earnings*		
	1995	2000	Percentage Change - 1995 to 2000
Legal Professionals	489.2	685.5	40.1
Sales Occupations nec	207.6	279.3	34.5
Road Transport Operatives	187.4	245.6	31.1
General Managers/Administrators	419.4	544.4	29.8
Specialist Managers	453.7	585.4	29.0
Hairdressers, Beauticians/Related	154.9	199.8	29.0
Plant/Machine Operatives nec	208.0	267.9	28.8
Engineers/Technologists	399.5	512.4	28.3
Production Managers:Manuf,Cons, etc	386.9	493.6	27.6
Architects, Town Planners/Surveyors	368.6	467.3	26.8
Sales Representatives	294.0	368.3	25.3
Textiles, Garments/Related Trade	171.0	213.9	25.1
Managers:Transport/Storing	329.5	411.3	24.8
Managers/Administrators nec	381.6	472.2	23.7
Health Associate Professionals	327.5	405.1	23.7
Catering Occupations	158.8	195.5	23.1
Scientific technicians	267.7	328.1	22.6
Managers/Proprietors:Service Industries	261.6	320.3	22.4
Stores/Despatch Clerks, Storekeepers	200.8	245.4	22.2
Secretaries, Personal Assistants, etc	252.8	308.5	22.0
Business/Financial Professionals	451.6	549.8	21.7
Receptionists, Telephonists/Related	197.7	240.6	21.7
Security/Protective Service Occupations	346.4	421.4	21.7
Other Occupations:Communication	251.8	305.6	21.4
Other Craft/Related Occupations nec	201.5	244.5	21.3
Food Preparation Trades	172.3	209.0	21.3
Business/Financial Associate Profs	402.8	488.3	21.2
Health Professionals	593.5	713.1	20.2
Teaching Professionals	400.6	481.3	20.1
Associate Professional/Technical nec	311.0	373.0	19.9
Sales Assistants/Check-out Operators	164.4	196.9	19.8
Filing/Records Clerks	216.8	259.6	19.7
Chemicals, Plastics/Related Process	222.0	265.3	19.5
Health/Related Occupations	189.5	226.2	19.4
Assemblers/Lineworkers	201.3	240.1	19.3
Computer Analyst/Programmers	412.6	492.0	19.2
Financial Institution/Office Managers	357.6	425.8	19.1
Other Occupations:Sales/Services	157.8	187.7	18.9
Social Welfare Associate Professionals	277.6	329.9	18.8
Food, Drink/Tobacco Process Operatives	215.4	255.9	18.8
Numerical Clerks/Cashiers	239.2	283.6	18.6
Domestic Staff/Related Occupations	172.1	204.0	18.5

Average gross weekly earnings of females in Great Britain in 1995 and 2000 continued

SOC 1990	Female average gross weekly earnings*		
	1995	2000	Percentage Change - 1995 to 2000
Other Routine Process Operatives	196.6	232.2	18.1
Clerks (not otherwise specified)	220.3	259.8	17.9
Professional Occupations nec	339.6	400.3	17.9
Childcare/Related Occupations	182.2	212.3	16.5
Administrative/Clerical Officers/etc	222.8	258.7	16.1
Natural Scientists	398.6	462.0	15.9
Literary, Artistic/Sports Professionals	397.1	459.3	15.7
Metal Working Process Operatives	194.0	223.9	15.4
Personal/Protective Service nec	206.6	230.5	11.6
Printing/Related Trades	235.3	258.5	9.9
Librarians/Related Professionals	349.9	378.5	8.2
Clerical/Secretarial Occupations nec	235.5	253.1	7.5
Travel Attendants/Related Occupations	318.3	308.3	-3.1
Textiles/Tannery Process Operatives	181.9	-	-
Electrical/Electronic Trades	-	402.0	-
Buyers, Brokers/Related Agents	-	434.8	-
Other Occupations:Agric/Forestry/Fishing	-	222.6	-
Other Occupations:Mining/Manufacturing	-	216.4	-
All occupations	269.8	337.6	25.1

Source: New Earnings Survey 1995 and 2000
*those whose pay was affected by absence are excluded

Chapter 6

Key Challenges

Introduction

This chapter of the report seeks to set out the main challenges and evidence-based agenda for action on skill issues in England. We draw together the main findings from the rest of the report in the form of key issues or challenges. These constitute the main skill weaknesses, which need to be addressed if England is to secure the 'world class' skills it desires.

England has made significant progress over recent years in terms of enhancing its skills base - qualification levels have increased considerably, the occupational structure has continued to shift towards higher skill jobs, skill requirements have continued to grow and participation in learning has also continued to expand - in many ways the country appears to have adapted effectively to changes in skill needs. However, this report, in synthesizing the wide range of research evidence now available, has identified a range of skills issues that do need to be addressed and which therefore provides a foundation on which an agenda for action could be developed.

This chapter summarizes these issues. We organize the skills issues around what we believe are the five key themes - what skills do we need; what skills are available; what is the nature and extent of our skills imbalances; the need to recognise the importance of regional and local differences; and the importance of social inclusion. We then conclude with some issues that may need to be addressed in taking the agenda forward.

The Key Themes

What Skills Do We Need?

- The process of economic change continues to drive changes in the labour market and consequent skill needs. The changing industrial structure (itself driven by changes in the pattern of consumer demand), technology and organisational change as well as the evolving pattern of national competitive advantage continues to change the balance of occupations, qualifications and skills required in the labour market.

- It is important to ensure that evolving patterns of skill supply 'match' the changing requirements of the labour market. Major structural shifts in the sectoral composition of output will mean that a substantial proportion of 'new' jobs will be in a relatively small number of sectors, most notably, in business services, health, education, distribution and hospitality. In occupational terms, growth continues to be in 'white collar' jobs, most particularly in caring and personal services; business and public service professional and associate professionals; teaching/research/technology professionals; and corporate managers. These occupations may account for as much as 8 in 10 of all new jobs growth in the next 10 years.

- Overall, jobs are growing in 'qualifications rich' occupations and it can be expected that more than half of new jobs growth over the coming decade will be at NVQ level 4 or equivalent, with particularly strong growth amongst corporate managers,

'other' professionals and associate professionals. It will be necessary to 'drive through' people from level 2 to level 3 and from level 3 to 4, in order to effectively meet this demand. Securing this progression will be of considerable importance.

- A further quarter of the new jobs growth is likely to be at level 3 and is, similarly, also likely to be concentrated in just a few occupations, most notably personal service, 'other' associate professional occupations and corporate managers.

- However in addition to meeting the skill needs of 'new' jobs it is also very important to replace the skills 'lost' through the normal process of labour turnover. This 'replacement demand' outstrips the scale of 'new' jobs growth by a factor more than $5^{1}/_{2}$ to 1. Moreover, the patterns of replacement and new jobs demand vary significantly across occupations. Occupations that are likely to experience rapid new jobs growth do not necessarily experience rapid replacement demand and those experiencing only modest expected jobs growth are often expected to experience high levels of replacement demand. Replacement demand is greatest in administrative occupations, caring and personal service occupations, sales occupations and clerical/service related elementary occupations.

It is essential that skills are available, therefore, to feed both new jobs growth and replacement demand - what we may call the 'overall requirement' of each occupation.

- A range of 'skill types' which cut across occupational, job specific, skills are also of considerable importance. These include:

    - generic skills requirements including problem solving, communication and team working skills;

    - basic skills of literacy and numeracy;

    - IT skills, from basic IT literacy through to advanced computing skills;

    - management skills.

- It is particularly important, however, to be aware of how these needs vary across occupations and sectors.

What Skills Are Available?

- Levels of educational attainment have increased considerably over recent years both amongst young people and adults. However, in respect of young people, girls outperform boys and attainment amongst some ethnic minority groups is relatively low.

- A quarter of the economically active have either no qualifications at all or qualifications below NVQ level 2 or equivalent. In particular, some ethnic minority groups, notably Black and Pakistani/Bangladeshi people, the unemployed, the economically inactive, those aged over 50 and people in manual occupations, are poorly qualified. It is especially important to boost the qualifications of ethnic

minority populations, not only on grounds of social inclusion, but because they constitute a significant proportion of workforce growth, especially in a range of urban areas.

- Poor basic skills are a significant issue with more than 1 in 5 adults having low/very low levels of literacy (below those expected of an 11 year old) and nearly a half having low/very low levels of numeracy.

- The growth in those qualified to NVQ level 3 or equivalent is relatively limited, with an especially low proportion of females progressing from level 2 to level 3. However, the growth of qualifications is largely a function of increased vocational qualifications.

- Over half of all attainment at NVQ levels 2 and 3 or equivalent are now vocational qualifications, though these are largely obtained by adults. Attainment by young people at these levels remains largely through acquiring academic qualifications.

- Though overall the numbers obtaining first degrees is growing by over 1% per year, there has been a decline in first degrees in engineering and technology; architecture/building/planning; and in education. This is paralleled by a decline in many technical subjects at sub degree level - notably construction and engineering. However across all levels of education there is an increase in those achieving IT/computer and business related qualifications.

- Youth participation in full time education and training, standing at just about half the cohort, is well below international levels, though it has improved considerably in recent years.

- Adult participation in education and training has not really increased since 1996 and there are considerable disparities in learning participation across different parts of the workforce. Participation is especially low amongst older people, the economically inactive, those who completed their initial education at an early age and those in 'lower' socio-economic groups.

- Barriers to increased participation remain considerable in terms of finance, time, the nature of provision and the motivation and confidence of non-participants.

- Participation in workforce training is relatively high and has grown in recent years. However, certain groups of employees - most notably the less well qualified, unskilled workers, and older workers, are less likely to receive formal job related training. Moreover, the size of establishment at which one works is an important factor in determining the level and type of training provided with small establishments providing relatively less off the job training and training that leads to qualifications.

- The skills of the most rapidly growing sections of the workforce are of particular importance. Growth is likely to be predominantly experienced amongst women, part-time workers and ethnic minorities.

- In terms of international comparisons, the skills of the workforce - whilst having improved considerably in absolute terms overtime, are relatively modest and do not appear to be improving:

    - At NVQ 2 level or equivalent, improvements in the proportions qualified to this level are less than in nearly all OECD countries and leave the UK with a relatively low proportion of young people in particular, qualified to this level. Literacy levels and achievement rates of young people at this level are also below those of the majority of OECD countries.

    - At tertiary level, absolute improvements, whilst considerable, are less than in most OECD countries. The UK also produces lower proportions of engineering, manufacturing and construction graduates than the average in the OECD.

    - In terms of participation in continuing education and training the international position of the UK is relatively strong though training 'intensity' is relatively low.

    - The distribution of training tends to reinforce existing differences in skill levels across the workforce, though less so than in many OECD countries.

    - Adult literacy and numeracy levels are relatively poor overall and unevenly distributed amongst the workforce giving rise to a 'polarized' skill distribution. The proportion of adults that are proficient at only the lowest level of literacy and numeracy is one of the highest in the OECD.

Skills Imbalances

- Various indicators of skills demand relative to supply show that it is largely managerial, professional and associate professionals who have experienced the strongest relative growth, though the pattern differs somewhat between men and women and is more complex at a detailed occupational level.

- The returns to different levels and types of qualification show that returns are high to level 3 and 4 qualifications, whether academic or vocational. The returns to academic qualifications at level 2 are also high but are low for vocational qualifications at this level and below - except for those of limited prior ability. There are also high returns to literacy and numeracy skills.

- The unemployed and economically inactive have levels of qualification and occupational experience which are substantially out of balance with the pattern of new jobs growth, though the imbalance is less in relation to patterns of replacement demand.

- The overall balance between skills demand and supply is likely to continue to tighten unless activity rates can be substantially increased.

- Skill shortages affect, overall, only a small proportion (some 4%) of establishments and currently refer to around 160,000 vacancies but they disproportionately affect

establishments employing less than 5 people (40% of all skill shortages are found here), some sectors and a range of occupational groups.

- The main skills shortages are in technical/practical skills; advanced IT skills, customer handling skills, communication skills; and team working skills. They are disproportionately found in the manufacturing, construction, wholesale/retail, health/social care and, especially, business services sectors. Their occupational distribution varies markedly by sector though three groups (professional, associate professional and craft occupations) account for more than half of all skill shortages. They are least prevalent in managerial/administrative occupations.

- Skill shortages affect organisational performance in a range of ways - lost orders, delays in product development, difficulties in providing customer service and so on. The sectors that are most negatively affected are the manufacturing and finance sectors as well as public sector organisations. Certain occupational skill shortages are particularly associated with a negative performance impact - skilled trades, managers and professional occupations.

- Skill gaps, which are currently estimated at affecting around 800,000 of those in work, affect around 7% of establishments. They disproportionately affect relatively larger establishments: more than a quarter of establishments which employ more than 25 people report the existence of a skills gap.

- The main skills gaps are in communication skills; non-IT practical/technical skills; team working; customer handling and problem solving skills. IT skill characteristics also feature prominently. They are disproportionately found in manufacturing (which accounts for nearly a quarter of all skill gaps), hospitality, wholesale/retail, financial services and public administration. Their occupational distribution varies considerably across the sectors though the largest gaps overall are in managers, production and process operatives, sales, 'other' manual and administrative/secretarial occupations.

- Skill gaps affect organisational performances in a range of ways, in particular, with regard to customer service, quality, costs and new working practices. Most sectors are affected and no particular occupational skill gaps appear to have a greater impact than others.

- One important cause of the existence of a skills gap is, in the first place, a failure to train staff - most often this is due to a lack of time, lack of funding and lack of cover for those being trained. Most organisations consider that the skills of their current workforce are adequate, despite two thirds believing that the skill needs of their employees is increasing. The pattern of training also varies considerably by occupational group. Moreover, training activity is a more common response to skill gaps than skill shortages.

- There is considerable qualitative evidence to reinforce the fact that skill shortages and skill gaps are highly diverse and specific to particular sectors and groups of the workforce. However, the broad message from dialogues and case studies is that there is a degree of concentration in two occupational groups in particular - associate professional and technical and craft related.

- There is some evidence to suggest the existence of latent skill gaps which, whilst currently unrecognised and unreported, are likely to appear as organisations seek to improve their competitive position, adopt higher value added product and service strategies and a 'high performance' route to economic success. Such gaps are consistent with the existence of a 'low skill equilibrium' being experienced by organisations. Though difficult to quantify precisely, corroborative evidence comes both from the existence of **higher** levels of skills gaps in organisations which provide more training and the existence of higher levels of skills shortages and gaps in rapidly growing regions and localities.

Regional and Local Differences

- There is a very considerable regional and local variation in many dimensions of the demand for, and supply of, skills as well as in the extent and nature of skill shortages and skill gaps. It is essential that these differentiating features are articulated, recognised and responded to by providers and agencies as well as by individuals and employers. There is a real danger of serious skill problems affecting local and regional, as well as national, economic performance and social exclusion, as a result of the existence of 'skill rich' and 'skill poor' areas. A danger exists of relative downward pressure on skill levels in some areas as a result of the viscous combination of weak skills supply and low levels of skills demand **combined** with pressure on skill availability in other areas as a result of strong skills supply and high levels of skills demand, where nonetheless the former cannot keep pace with the latter.

- Overall jobs growth varies substantially across the regions - there has been almost no growth in the North East and Yorkshire and Humberside in recent years compared to very rapid growth in London and the South East.

- The pattern of sectoral and occupational change across the regions has been highly variable with substantial manufacturing decline in the North West, Midlands and London co-existing with rather modest reductions in manufacturing jobs in the South East, South West and East Midlands. Similarly, nationally rapidly growing sectors (like business services) grew even more rapidly in, for example, the South East and London whilst experiencing only modest expansion in the North East. In occupational terms there has been particularly strong growth in managerial, professional and associate professional/technical jobs in London and the South East, with more modest growth elsewhere, particularly in the North East.

- Regional variations in qualifications trends are also substantial, with very large increases expected at levels 4 and 5 in London, the East and South East but much slower growth in the West Midlands, North East and Yorkshire and the Humber. Between 40% and 50% of all jobs with qualifications at these levels are in London and the South East. At level 3, London is expected to see a small decline and the North East only a modest increase in contrast to substantial increases in the South West and South East. The reductions in the likely employment of people with no qualifications is most rapid in the North West and West Midlands but is rather modest in the Eastern region.

- Evidence from the Skills Survey research corroborates that from trends in occupations and qualifications with upskilling appearing to have been strongest in the 1990s in the South West and North West overall with possible 'de-skilling' occurring only in the North East and East Midlands.

- Skill levels vary substantially too with the proportion of those of working age qualified to NVQ3 or its equivalent, or above varying by 10% points from a high in London to a low in the North East. At the level of the LSC areas, differences of up to 22% points are evident with half of all LSC areas being below the England average, most in central and northern England, the East coast and Cornwall/Devon, though intra-regional variations are also substantial in most regions.

- Young peoples' participation in full time education also varies considerably across LSC areas from a high of 76% in Gloucestershire to a low of 47% in Suffolk.

- Training provision also varies across the regions by as much as 20% in terms of the proportion of establishments providing training. Training levels appear to be actually **lower** in high qualification and employment regions, an apparently paradoxical finding unless significant levels of training are designed to remedy existing skill dificiencies.

- Skill shortages are predominantly concentrated in London and the South East, and to a lesser extent, in the South West and Eastern regions. However, the scale of variations is greater within, than between, regions though there is a general North-South divide apparent with, in particular, a concentration of shortages in areas of most rapid jobs growth.

- There are fewer regional variations in skill gaps though, as a proportion of employment they are greatest in the South West and West Midlands. They do however vary greatly between LSC areas with gaps generally being more prevalent across large parts of South and East England with, on the other hand, the North East experiencing by far the lowest number of skill gaps.

Social Inclusion and Inequality

- Skills are unequally distributed across various groups in the population. Given the importance of the possession of skills to individual labour market success and to social inclusion, it is important to recognise the existence of these extensive skill inequalities. There are 4 main dimensions to these inequalities as covered in this research review: educational attainment, basic skills, participation in education and training and the gendered nature of such participation.

- There are considerable inequalities in educational attainment. Around 30% of the workforce either have no qualifications or hold qualifications below NVQ level 2 or equivalent. Attainment levels are also uneven across different social groups, with the unemployed, economically inactive those aged over 50 and those employed in manual occupations amongst the groups who are least likely to hold any formal qualifications. 29% of the long term unemployed and nearly 40% of the

economically inactive have no qualifications at all. In particular, certain ethnic minorities groups are more likely not to hold any qualifications - individuals from the Bangladeshi, Pakistani and Black Caribbean groups are particularly disadvantaged in this regard. As minority ethnic groups are expected to account for more than half of the growth of the working age population over the next 10 years their attainment levels are therefore of particular importance - especially in localities where they already constitute a large proportion of the actual or potential workforce.

- Poor basic skills are a problem for a significantly large minority of the workforce. Around 1 in 5 adults have lower levels of literacy than that expected of an average 11 year old and nearly half of adults have lower levels of numeracy than that expected of an average 11 year old. There may be as many as 7 million adults who could be considered functionally illiterate or inumerate. Those groups most likely to suffer from low basic skills levels include older people, those with low or no educational attainment, the economically inactive and the unemployed, non whites (especially Punjabi and Bengali speakers) and ex-offenders.

- Participation levels in post compulsory education vary widely and so need to be increased in order to both raise attainment and to reduce inequalities in skills levels. The proportion of **young people** participating in education post 16 has increased considerably over recent years but compared to most other OECD countries young people's participation in full time education is low and being well below the rate in many of our major competitor countries such as the USA, Netherlands, Ireland, Germany and Sweden.

- Participation in **adult learning** has remained relatively constant over the last few years with just less than 40% not participating in learning since they completed their full time education. There are significant disparities in participation rates in learning across different groups in the workforce. In particular, low levels of participation are apparent amongst older people, the economically inactive, those in skilled, semi and unskilled manual occupations and those who completed their initial education at the earliest age.

- In respect of workplace training, whilst there has been a substantial growth in **workplace training** in recent years, access to such training is unevenly distributed amongst the workforce. Certain groups of employees, most notably plant/machine operatives and those in elementary occupations, the less-qualified, part-time workers and older workers, are amongst those least likely to receive formal job-related training. Furthermore this inequality in training is cumulative - those who do not receive it in one year tend also to be excluded from it in future years. Establishment size is an important influence on the level and type of workplace training provided with smaller establishments less likely to provide formal workplace training than larger ones, especially in respect to off-the-job training. They are also less likely to provide training that leads to formal qualifications.

- Participation in post compulsory education is often gendered. For example, there is a strong gender dimension to participation in degree programmes with three quarters of those studying subjects allied to medicine being women and over 70% of those studying languages or education. On the other hand 85% of those

studying engineering and technology are men, as are 80% of those studying computer science.

- Similarly there is a gender dimension to the subjects/occupational areas in which trainees on Modern Apprenticeship programmes participate with only 1% of Advanced Modern Apprenticeship trainees in electrical engineering, plumbing and construction being women compared to the 90% of trainees being women on travel, social care, child care and hairdressing programmes.

- These systematic differences in participation by gender create inequalities between men and women, not only in terms of skill acquisition but also in continuing the occupational segregation of men and women within the labour market.

Taking Forward the Agenda

There are four further issues which need to be considered in taking this challenging agenda forward.

Skills are Valuable

The message that skill acquisition is important - for people, for employers for the economy, for the regions and for communities - needs to be reinforced in order to encourage higher levels of attainment and participation in skill formation. Skills have an important role to play in both the competitiveness and the social inclusion agendas.

Adapt to Change

The scale and nature of the structural shifts in the economy require companies, other organisations, public agencies, providers and people themselves to adapt to the ongoing changes in skill needs, by investing in the appropriate level and mix of skills consistent with economic and labour market needs. In increasingly tight labour market conditions it is all the more necessary that employers, providers and individuals can effectively 'match' their skill requirements.

The Role of Research

Most of the skills issues that need to be addressed exhibit a high degree of particularity and specificity. Many of the problems are concentrated amongst certain social groups, sectors, occupations or geographical areas and thus a targetted approach founded on a clear knowledge of the relevant issue, is required. Sound and accessible research becomes a key tool in effective policy development and service delivery.

- It is essential that the key messages and findings from the research evidence contained in this report are widely disseminated to all those engaged in the skills agenda - employers; sector bodies; regional development agencies; education and training providers; Learning and Skills Councils; information, advice and guidance

bodies; and regeneration partnerships, amongst others - in order to inform their strategic and corporate planning as well as their delivery of services. Conferences, seminars and workshops would be amongst the most valuable means of accessing and discussing the contents of the report, with a view to embedding its key lessons in policy and practice.

- The skills agenda as identified through this research evidence, needs to be carefully linked at national, regional and local levels to the wider economic and social inclusion agendas of which it forms such a valuable component. At the regional level this could be achieved through the new Frameworks for Employment and Skills that will be developed by RDAs and their partners and at the local level by the Local Strategic Partnerships.

- The approach adopted in this skills assessment, in terms of its main components and nature of its evidence base, could be used as a framework within which regional and local skills assessments could be conducted by the RDAs and LSCs respectively. This national report could also be used as a benchmark against which local and other regional results could be reported. Indeed it is hoped that much of the regional and local material presented in this report will be used in the production of such assessments.

Research Gaps

- Finally, there are a number of research and information gaps that have been identified as part of the process of developing this research report. They are briefly identified here so as to inform the future skills research agenda and in order to make future versions of this skills assessment more valuable and comprehensive.

    - Evidence on the returns to different types of academic and vocational qualifications in terms of the subjects studied.

    - Evidence of the impact of training activity on productivity and profitability and of the impact of workforce qualification levels on organisational performance.

    - Evidence and the impact of non formal and non accredited learning/training on individual and organisational success.

    - Data on the content of training activity.

    - Evidence on the effects of training on national economic performance.

    - Estimates of replacement demand at the regional level.

    - Assessment of the impact of management competence on organisational performance.

    - Relationship between the possession/acquisition of generic skills in the workforce and organisational performance.

- Relationship between skill levels and their development, and various dimensions of economic performance at the national and local level.

- The (observed) association between low training levels in high qualification localities and vice versa.

- Updating of data and benchmarking on the comparitive international position of the UK/England across a range of skills indicators.

Annexes

Annex 1 Useful Skills and Labour Market Data and Research Websites

Datasphere - the labour market, learning and skills website (provides access to skillsbase; dfes statistics; the skills and enterprise network website; and the national statistics website). - www.dfes.gov.uk/datasphere

Department for Education and Skills, Statistics (from Analytical Services, including statistical publications) - www.dfes.gov.uk/statistics

Department for Education and Skills, Skillsbase - www.skillsbase.dfes.gov.uk

National Statistics/statbase (to download a range of statistics and access the statsearch facility) - www.statistics.gov.uk/statbase

Learning and Skills Council - www.lsc.gov.uk

National Training Organisations - www.nto-nc.org

NOMIS - offers access to the most up-to-date and detailed labour market data produced from official sources - www.nomisweb.co.uk

Annex 2 Foresight Sector Studies

Name of Organisation	Address	Tel. No./Website	Title of report
Employment NTO	Kimberley House 47 Vaughan Way Leicester LE1 4SG	0116 251 7979 www.empnto.co.uk	Skills Foresight
Lantra: The Landbased NTO	Lantra House NAC Kenilworth Warwickshire CV8 2LG	024 7669 6996 www.lantra.co.uk/nto	Skills Foresight 2001
Transfed: The Road Passenger Transport NTO	Transfed PO Box 29085 London WC2B 6TR	0207 240 3131 www.cpt-uk.org/cpt	Skills Foresight
e-business NTO	1 Castle Lane London SW1E 6DR	020 7963 8920 www.e-skillsnto.org.uk	Skills Foresight
Financial Services NTO	27-32 Poultry London EC2P 2BX	020 7260 3742 www.fsnto.org	Skills Foresight for International Banks and HR Managers
Association for Ceramic Training & Development (ACTD)	St James house Webberley Lane Longton Stoke-on-Trent ST3 1RJ	01782 597016 www.actd.co.uk	
Hairdressing and Beauty Industry Authority (HABIA)	2nd Floor Fraser House Nether Hall Road Doncaster South Yorkshire DN1 2PH	01302 380000 www.habia.org	Skills Foresight Report 2000

Steels and Metals Industry NTO	5&6 Meadowcourt Amos Road Sheffield S9 1BX	0114 244 6833 www.sinto.co.uk	
Road Haulage and Distribution Training Council (RHDTC)	14 Warran Yard Warran Farm Office Village Stratford Road Milton Keynes MK12 5NW	01908 313360 www.rhdtc.co.uk	Skills Foresight for the Road Haulage and Distribution Industry
Glass NTO	BGMC Building Northumberland Road Sheffield S10 2UA	0114 266 1494 or 266 9263 www.glass-training.co.uk	Skills Foresight Report 2000/2001
GINTO: The Gas Industry NTO	The Business Centre Edward Street Redditch Worcestershire B97 6HR	01527 584848 www.ginto.co.uk	Labour Market Investigation and Skills Foresight Report
Metier: NTO of the Arts & Entertainment Sector	Glyde House Glydegate Bradford BD5 0BQ	01274 738800 www.netgain.org.uk	Art Skills 2000
Food and Drink NTO	6 Catherine Street London WC2B 5JJ	020 7836 2460 www.fds.org.uk	Skills Foresight for the Food and Drink Industry
Housing Potential UK: The NTO for Housing	Octavia house Westwood Way Coventry CV4 8JP	024 7685 1796 www.housingpotential.com	Labour Market Information and Skills Foresight Report
The Association of the British Pharmaceutical Industry (abpi)	12 Whitehall London SW1A 2DY	020 7930 3477 www.abpi.org.uk	Skills Foresight

Accountancy National Training Organisation (ANTO)	Viking House Swallowdale Lane Hemel Hempstead Hertfordshire HP2 7EA	01442 250525 www.anto.org	Skills Foresight
The Dairy Training and Development Council	19 Cornwall Terrace London NW1 4QP	020 7486 7244 www.dairytraining.org.uk	Competing through skills
EPIC The NTO for the extractive and mineral processing industries	36-38 London Road St Albans Hertfordshire AL1 1NG	01727 869008 www.epicnto.com	The Skills Foresight Strategy
Electricity Training Association (ETA)	30 Millbank London SW1P 4RD	020 7963 5848 www.eta.org.uk	Employment and Skills Study of the UK Electricity Industry
TOPSS: The Training Organisation for the Personal Social Services	26 Park Row Leeds LS1 5QB	0113 245 1716 www.topss.org.uk	Modernising the Social Care Workforce
National Electrotechnical Training Organisation (NET)	34 Palace Court London W2 4HY	020 7313 4846 www.net-works.org.uk	10 years On: Skills in the Electrotechnical Industry
Information Services NTO	1st Floor Glyde House Glydegate Bradford BD5 0UP	01274 391773 www.isnto.org.uk	Skills Foresight in the Information Services Sector
CITB	Research Department Head Office Bircham Newton King's Lynn	01485 577577 www.citborg.uk	Construction Skills Foresight Assessment

Furniture, Furnishings & Interiors National Training Organisation (FFINTO)	The Poplars Wollaton Road Beeston Nottingham NG9 2PD	0115 922 1200 www.ffinto.org	Skills Foresight
Local Government National Training Organisation (Ignto)	Layden House 76-86 Turnmill Street London ECIM 5LG	020 7296 6666 01223 890660 www.lgnto.gov.uk	Skills for the future
Bakery Training Council (BTC)	Dovecote Barn South Wraxall Bradford on Avon BA15 2SE	Tel/fax 01223 890660 www.bakerytraining.co.uk	Skills Foresight for the Bakery Industry
Petroleum Industry National Training Organisation (PINTO)	8 Fulton Road Wembley HA9 OND	020 8982 1550 www.pinto.co.uk	Skills Foresight Report for the Downstream Petroleum Industry
Community Justice National Training Organisation (CJNTO)	344-354 Grays Inn Road London WC1X 8BP	020 7278 1366 www.cjnto.org.uk	Skills Foresight Analysis
Distributive NTO	Mardall House 9-11 Vaughan Road Harpenden AL5 4HU	01582 760809 www.dnto.com	Labour Market and Skills Issues in the Distributive Industry
The Higher Education Staff Development Agency (HESDA)	Ingram House 65 Wilkinson Street The University of Sheffield Sheffield S10 2GJ	0114 222 1335 www.hesda.org.uk	Labour Market Information Project
Healthwork UK; The Healthcare NTO	344-354 Gray's Inn Rd London WC1X 8BP	020 7692 5550 www.healthwork.co.uk	

British Plumbing Employers Council (Training) Ltd (BPEC): The NTO for the Plumbing Industry	2 Walker Street Edinburgh EH3 7LB	0131 225 2255 www.bpec.org.uk	Skills Foresight Analysis
Cultural Heritage NTO	1st Floor, Glyde House Glydegate Bradford BD5 OUP	01274 391056 www.chnto.co.uk	Cultural Heritage Labour Market Information Report
Custodial Care NTO	Churchill House 12 Mosley Street Newcastle upon Tyne NE1 1DE	0191 230 8072 www.ccnto.com	Skills Foresight Analysis
Polymer NTO	Halesfield 7 Telford Shropshire TF7 4N7	01952 587020 www.painto.org.uk	Skills in the Rubber Processing Industry Skills Foresight Report for the Plastics Processing Sector
National Training Organisation for Engineering Manufacture (EMTA)	EMTA House 14 Upton Road Watford Hertfordshire WD18 0JT	01923 256086 www.emta.org.uk	Skills Foresight 2000
Engineering Construction Industry Training Board (ECITB)	Blue Court Church Lane Kings Langley Herts WD4 8JP	01923 260000 www.ecitb.org.uk	Skills Foresight
Engineering Services Training Trust Ltd (ESTTL)	Gear House Saltmeadows Road Gateshead NE8 3AH	0191 490 3306 www.esttl.org.uk	Skills Foresight for the Heating, Ventilating, Air Conditioning and Refridgeration Industry.
Motor Industry Training Council	201 Great Portland Street LONDON W1N 6AB	020 7436 5108 www.motor.careers.co.uk	Skills Foresight Report for the Retail Motor Industry

CAPITB Trust: UK Clothing Industry	CAPITB Trust: UK Clothing Industry 80 Richardshaw Lane Pudsey Leeds LS28 6BN	0113 2273345 www.capitbtrust.org.uk	Future Skill Needs in the Clothing Sector
FENTO: Further Education NTO	4th Floor 1-6 Ely Place London EC1N 6RY	0207 242 4662 www.fento.org.uk	Skills Foresight

Note: 1. This list is compiled on the basis of contacting all NTOs with a request to provide a copy of their Foresight Report for inclusion in this annex to the report. In many cases the NTO has also made available their workforce development plans.

References

Appelbaum, E. and Albin, P. (1989) 'Computer rationalisation and the transformation of work: lessons from the insurance industry', in S. Wood (ed.) *The Transformation of Work? Skill, Flexibility and the Labour Process*. London: Unwin Hyman, pp.247-265.

Ashton, D., Davies, B., Felstead, A. and Green, F. (1999) *Work Skills in Britain*. Coventry: University of Warwick, Centre for Skills, Knowledge and Organisational Performance.

Atkinson, J. and Spilsbury, M. (1993) *Basic Skills and Jobs: a Report on the Basic Skills Needed at Work*. London: Adult Literacy and Basic Skills Unit.

Basic Skills Agency (1997) *Staying the Course: the Relationship Between Basic Skills Support, Drop Out, Retention and Achievement in Further Education Colleges*. London: Basic Skills Agency.

Barrett, A et al. (1998) *Exploring the Returns to Continuing Vocational Training in Enterprises*. Thessaloniki, CEDEFOP.

Beirne, M., Ramsay, H. and Panteli, A. (1998) 'Developments in computing work: control and contradiction in the software labour process', in P. Thompson and C. Warhurst (eds.) *Workplace of the Future*. Basingstoke: MacMillan.

Blundell, R., Dearden, L., Meghir, C. and Sianesi, B. (1999) Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy, Fiscal Studies Vol 20, No 1 Pages 1-23.

Blundell, R., Dearden, L. and Meghir, C. (1996) The Determinants of Work Related Training in Britain, London, IFS

Borghans, L. and De Grip, A. (eds.) (2000) *The Overeducated Worker? The Economics of Skill Utilization*. Cheltenham: Edward Elgar.

Borghans, L. and ter Weel, B. (2001) *How Computerization Changes the UK Labour Market: The Facts Viewed from a New Perspective*. SKOPE Research Paper 13. Coventry: University of Warwick, Centre on Skills, Knowledge and Organisational Performance.

Bosworth, D. (1999) *Empirical Evidence of Management Skills in the UK*. Skills Task Force Research Paper 18. Nottingham: Department for Education and Employment.

Bosworth, D. (2000) *Employers Skill Survey: Statistical Report*. Nottingham: Department for Education and Employment.

Bosworth, D., Davies, R. and Wilson, R. A. (2001) *Skills and Performance: An economic analysis of ESS 1999*. Nottingham: Department for Education and Skills.

Brooks, G., Giles, K., Harman, J., Kendall, S., Rees, F. and Whittaker, S. (2000) *Assembling the Fragments: Review of Research on Adult Basic Skills*. DfEE Research Report RR220. Nottingham: Department for Education and Employment.

Bynner, J. et al (2001) Improving Adult Basic Skills: Benefits to the Individual and Society, DfES Research Report. No. 251.

Bynner, J. (2001) 'Adult participation and progression in education', in F. Coffield (ed.) *What Progress Are We Making with Lifelong Learning? The Evidence From Research*. Newcastle: University of Newcastle, Department of Education, pp.51-62.

Bynner, J. and Parsons, S. (1997) It Doesn't Get Any Better, BSA.

Campbell, M. (1999) Spatial Variations in Skills: Issues and Implications, National Skills Task Force Research Paper No.14, London, DfEE.

Campbell, M. (2000) *Learning Pays and Learning Works*. Sheffield: National Advisory Council for Education and Training Targets.

Claydon, T. (1994) 'Employee Commitment and the Skills Revolution', Book Review, *British Journal of Industrial Relations*, 32(2), pp.289-291.

Cockburn, C. (1985) *Machinery of Dominance: Women, Men and Technical Know-How*. London: Pluto Press.

Coleman, S. and Keep, E. (2001) *Background Literature Review for PIU Project on Workforce Development*. SKOPE mimeo. Coventry: University of Warwick, Centre on Skills, Knowledge and Organisational Performance.

Connor, H., Dench, S. and Bates, P. (2000) *An Assessment of Skill Needs in Engineering*. Nottingham: Department for Education and Employment.

Connor, H., Hillage, J., Millar, J. and Willison, R. (2001) *Skill Needs in Information and Communication Technology*. Brighton: Institute for Employment Studies.

Coyle, A. (1995) *Women and Organisational Change*. Manchester: Equal Opportunities Commission.

Dearden, L., Reed H and Van Reenan, J. (2000) Who Gains When Workers Train? Working Paper 00/04, London IFS.

Dearden, L., MacIntosh, S., Myck, M. and Vignoles, A. (2000) *The Returns to Academic Vocational and Basic Skills in Britain*. DfEE Research Report RR192. Nottingham: Department for Education and Employment.

Dearden, L., McIntosh, L., Myck, M., and Vignoles, A. (2001) Basic Skills, Soft Skills and Labour Market Outcomes, DfES Research Report No. 250.

Department for Education and Skills (2001) Vocational Qualifications in the UK: 1999/00. Statistical Bulletin, No. 5/01, May.

Department for Education and Skills (2001b) Moving On, September.

Department for Education and Employment (1999) *Report of the Working Group on Post-School Basic Skills (Moser Report)*. London: Department for Education and Employment.

Department for Education and Skills (2000) *Training Statistics for the UK*. Stationery Office.

Department of the Environment, Transport and the Regions (1998) *Rethinking Construction*. Rotherham: Department of the Environment, Transport and the Regions.

Department of Trade and Industry (2001) *UK Competitiveness Indicators*. Second Edition. London: Department of Trade and Industry.

Dolton, P., Makepeace, G., Hutton, S. and Andes, R. (1999) *Making the Grade. Education, the Labour Market and Young People*. York: Joseph Rowntree Foundation.

Elias, P. and Bynner, J. (1997) 'Intermediate Skills and Occupational Mobility', *Policy Studies*, 18(2), pp.101-124.

Equal Opportunities Commission (2001) *Facts about Women and Men in Great Britain*. Manchester: Equal Opportunities Commission.

Felstead, A. (forthcoming) 'Putting skills in their place: the regional pattern of work skills in late Twentieth Century Britain', in K. Evans, P. Hodkinson and L. Unwin (eds.) *Learning and the Workplace*. London: Kogan Page.

Felstead, A., Ashton, D. and Green, F. (2000) 'Are Britain's workplace skills becoming more unequal?' *Cambridge Journal of Ecomomics*, 24, pp.709-727.

Felstead, A., Ashton, D., Burchell, B. and Green, F. (1999) 'Skill trends in Britain: trajectories over the past decade', in F. Coffield (ed.) *Speaking Truth to Power: Research and Policy on Lifelong Learning*. Bristol: Policy Press, pp.55-72.

Frank, F. and Hamilton, M. (1993) *'Not Just a Number': the Role of Basic Skills Programmes in the Changing Workplace. An Account of a Leverhulme Trust Funded Project*. Lancaster: Lancaster University, Centre for the Study of Education and Training.

Gallie, D. (1991) 'Patterns of Skill Change', *Work, Employment and Society*, 5(3), pp.319-351.

Green, A. E. and Owen, D. (2001) *Skills, Local Areas and Unemployment*. Nottingham: Department for Education and Employment.

Green, F. (1999) 'Training the workers', in P. Gregg and L. Wadsworth (eds.) *The State of Working Britain*. Manchester: Manchester University Press.

Green, F. (1999). *The Market Value of Generic Skills*. Skills Task Force Research Paper 8. Sudbury: Department for Education and Employment.

Green, F., Ashton, D., Burchell, B., Davies, B. and Felstead, A. (2000) 'Are British workers becoming more skilled?' in L. Borghans and A. De Grip (eds.) *The Overeducated Worker? The Economics of Skill Utilization*. Cheltenham: Edward Elgar, pp.77-106.

Green, F., Felstead, A. and Gallie, D. (2001) *Computers Are Even More Important Than You Thought: An Analysis of the Changing Skill-Intensity of Jobs*. CEP Discussion Paper 439. London: London School of Economics, Centre for Economic Performance.

Green, F. Felstead, A. and Gallie, D. (forthcoming) Workskills in Britain 2001.

Grundy, F. (1996) *Women and Computers*. Exeter: Intellect Books.

Harmon, C., and Walker, I. (2001) The Returns to Education, DfES Research Report No. 254.

Harvey, J. (1995) ‘Up-skilling and the intensification of work: the ‘extended role’ in intensive care nursing and midwifery’, *Sociological Review*, 43(4), pp.765-781.

'HEFCE invites proposals for development of foundation degrees', HEFCE Press Release, 10 July 2000. www.hefce.ac.uk/news.

Heyes, J. (2000) 'Skill Formation and the Politics of Production: Exploring Training in the Workplace'. Lifelong Learning Institute Research Seminar Paper, 3 May 2000, Leeds University Business School.

Hillage, J., Uden, T., Aldridge, F. and Eccles, J. (2000) *Adult Learning In England: A Review*. Brighton: Institute for Employment Studies.

Hogarth, T., Wilson, R., Shury, J. and Vivian, D. (2001) *Employers Skill Survey 2001*. Nottingham: Department for Education and Skills.

Hogarth, T., and Wilson, R. (2001) *Skills Matter: A Synthesis of Research on the Extent, Causes and Implications of Skill Deficiencies*. Nottingham: Department for Education and Skills.

Holt, R., Harris, F., Blake, N., Shabord, E., Murray, S. and Trueman, B. (2000) *An Assessment of Skill Needs in Construction and Related Industries*. Nottingham: Department for Education and Employment.

Institute for Employment Research (2000) ‘Poor Skills at Regional and Local Level’, in IER Bulletin, 52, pp.1-6.

Institute for Employment Studies (2001) The Assessment of Skill Needs in Information and Communication Technology, Nottingham. Department for Education and Skills.

Institute for Employment Studies (2001) Skill Needs in Engineering, Skills Dialogue Report No 2, London, DfEE.

Johnson, S. (1999) *Skills Issues in Small and Medium Sized Enterprises*. Skills Task Force Research Paper 13. Nottingham: Department for Education and Employment.

Johnson, S. and Winterton, J. (1999) *Management Skills*. Skills Task Force Research Paper 3. London: Department for Education and Employment.

Keep, E. (1999b) *Employers' Attitude to Training*. Skills Task Force Research Paper 15. Nottingham: Department for Education and Employment.

Kennedy, H. (1997) *Learning Works: Widening Participation in FE*. Coventry: Further Education Funding Council.

Kodz, J., Tackey, N., Pollard, E., Dench, S., Tyers, C., and Dewson, S. (2000) *Modern Apprenticeships and National Traineeships: Skills Utilisation and Progression*. Nottingham: Department for Education and Employment.

KPMG (2001) 'An Overview of the Skills, Training and Qualifications of Associate Professional Occupations'. Draft Report.

KPMG (2001) 'Financial Services Sector Skills Dialogue'. Draft Report to Department for Education and Employment. April.

LANTRA (2001) *Skills Foresight, 2001: A Dialogue for Action*. Kenilworth: LANTRA.

Learning and Skills Council (2001) Strategic Framework to 2004: Corporate Plan, Coventry, Learning and Skills Council

Lloyd, C. (1997) 'Microelectronic in the clothing industry: firm strategy and skills debate', *New Technology, Work and Employment*, 12(1), pp.36-47.

Lloyd, C. and Steedman, H. (1999) *Intermediate Level Skills – How Are They Changing?* Skills Task Force Research Paper 4. Sudbury: Department for Education and Employment.

Machin, S. and Vignoles, A. (2001) The Economic Benefits of Training to the Individual, the Firm and the Economy: The Key Issues, paper prepared for the Cabinet Office Workforce Development Project, Centre for the Economics of Education, April.

Mackinnon, I. and Cooper, C. (2001) *An Assessment of Skill Needs in the Transport Sector*. Nottingham: Department for Education and Employment.

Manncorda, M. and Robinson, P. (1997) 'Unskilled or Overqualified? Qualifications, Occupations and earnings in the British Labour Market'. Paper presented to the LoWER Conference, Centre for Economic Performance, LSE, (12-13 December).

Mason, G. (1999) The Labour Market for Technical Graduates: Are There Mismatches Between Supply and Demand? Research Report No.112, London, DfEE.

Mason, G. (2001) 'The Mix of Graduate and Intermediate-level skills in Britain: what should the balance be?' *Journal of Education and Work*, (14)1, pp.5-26.

McIntosh, S. and Steedman, H. (2001) 'Learning in the workplace: some international comparisons', in F. Coffield (ed.) *What Progress Are We Making with Lifelong Learning? The Evidence from Research*. Newcastle: University of Newcastle, Department of Education, pp.87-100.

Millar J and Jagger N (2001) Women in ITEC Courses and Careers, SPRU/IES, Sussex.

Morrell, J. Smith, G. (forthcoming) Exploring ICT Skills Deficiencies in the UK.

Morris, M., Nelson, J., Rickinson, M., Stoney, S. and Benefield, P. (1999) *A Literature Review of Young People's Attitudes Towards Education, Employment and Training*. DfEE Research Report RR170. Nottingham: Department for Education and Employment.

Moser, Sir C. (1999) *A Fresh Start: Improving Literacy and Numeracy*. Sudbury: Department for Education and Employment.

Mutch, A. (1998) 'The Impact of Information technology on 'traditional' trades occupations: the case of welding', *New Technology, Work and Employment*, 13(2), pp.140-149.

National Advisory Council for Education and Training Targets (2000) *Aiming Higher. NACETT's Report on the National Learning Targets for England and advice on the Targets beyond 2002*. Sheffield: National Advisory Council for Education and Training Targets.

National Skills Task Force (1999) *Delivering Skills for All: Second Report of the National Skills Task Force*. Sudbury: Department for Education and Employment.

National Skills Task Force (2000a) *Skills for All: Research Report for the National Skills Task Force*. Sudbury: Department for Education and Employment.

National Skills Task Force (2000b) *Tacking the Adult Skills Gap: Upskilling Adults and the Role of Workplace Learning. Third Report of the National Skills Task Force*. Sudbury: Department for Education and Employment.

National Skills Task Force (2000c) *Skills for All: Final Report of the National Skills Task Force*. Sudbury: Department for Education and Employment.

National Statistics (2000a) *Education and Training Statistics for the United Kingdom*. 2000 Edition. London: The Stationery Office.

National Statistics (2000b) *Regional Trends 35*. 2000 Edition. London: The Stationery Office.

Organisation for Economic Co-operation and Development (1998) *Human Capital Investment: An International Comparison*. Paris: Organisation for Economic Co-operation and Development.

O'Connell, P. J. (1999) Adults in Training: An International Comparison of Continuing Education and Training, CERI/WD (99) 1, Centre for Education Research and Innovation, OECD, Paris.

Organisation for Economic Co-operation and Development (1998) Human Capital Investment: An International Comparison, Paris, OECD.

Organisation for Economic Co-operation and Development (1999) Employment Outlook, Paris, OECD.

Organisation for Economic Co-operation and Development (2000) *Education at a Glance: OECD Indicators*. 2000 Edition. Paris: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-operation and Development (2001a) *Education at a Glance: OECD Indicators*. 2001 Edition. Paris: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-operation and Development (2001b) *Education Policy Analysis*. Paris: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-operation and Development (2001c) Cities and Regions in the New Learning Economy, Paris, OECD.

Organisation for Economic Co-operation and Development and Statistics Canada (2000) *Literacy in the Information Age*. Paris: Organisation for Economic Co-operation and Development.

Owen, D., Green, A., Pitcher, J. and Maguire, M. (2000) *Minority Ethnic Participation and Achievements in Education, Training and the Labour Market*. DfEE Research Report RR225. Nottingham: Department for Education and Employment.

Pathak, S. (2000) *Race Research for the Future. Ethnicity in Education, Training and the Labour Market*. DfEE Research Topic Paper RTP01. Nottingham: Department for Education and Employment.

Patterson M. G. et al (1997) Impact of People Management Practices on Business Performance, Issue in People Management No.22, London, CIPD.

Psacharopoulos G (1984) Earnings and Education in OECD Countries, Paris, OECD.

Rainbird, H. (2000) 'Skilling the unskilled: access to work-based learning and the lifelong learning agenda', *Journal of Education and Work*, 13(2), pp.184-197.

Robinson, P. (1997) *Literacy, Numeracy and Economic Performance*. London: London School of Economics and Political Science, Centre for Economic Performance.

Ruddock, G. (2000) *Third International Mathematics and Science Study Repeat (TIMSS-R): First National Report*. DfEE Research Report RR234. Nottingham: Department for Education and Employment.

Ryan, P. (1991) ‘Introduction: comparative research on vocational education and training’, in P. Ryan (ed.) *International Comparisons of Vocational Education and Training for Intermediate Skills*. London: Falmer Press.

Sargant, N. (2000) *The Learning Divide Revisited: A Report of the Findings of a UK-Wide Survey on Adult Participation in Education and Learning*. Leicester: National Institute of Adult Continuing Education.

Sianasi B and Van Reenan J (2000) The Returns to Education: A Review of the Macroeconomic Literature, Centre for Economics of Education Discussion Paper.

Senker, J. and Senker, P. (1994) 'Information technology and skills in manufacturing', in K. Ducatel, (ed.) *Employment and Technical Change in Europe*. Aldershot: Edward Elgar.

Spilsbury, D. (2001) *Learning and Training at Work 2000*. DfEE Research Report RR269. Nottingham: Department for Education and Employment.

Stern, E., and Sommerlad, E. (1999) *Workplace Learning, Culture and Performance*. London: Institute of Personnel and Development.

Storey, J. (1995) 'Employment policies and practices in UK clearing banks: an overview', *Human Resource Management Journal*, 5(4), pp.24-43.

Sturm R (1993) How Do Education and Training Affect a Country's Economic Performance. Santa Monica, R. and Institute on Education and Training.

Tackey, N., Hillage, J., Jagger, N. and Bates, P. (2000) *The Skills Implications of Electronic Retailing*. Final Report to Department of Trade and Industry. Brighton: Institute for Employment Studies.

Wilson, R. A. (2000) *Projections of Occupations and Qualifications 1999/2000*. Sheffield: Department for Education and Employment.

Wilson, R. A. (2001a) *Projections of Occupations and Qualifications 2000/2001*. Volume 1 UK Results. Sheffield: Department for Education and Employment.

Wilson, R. A. (2001b). Projections of Occupations and Qualifications 2000/2001. Volume 2 Regional Results. Sheffield: Department for Education and Employment.

Winterton, J., Parker, M., Dodd, M., McCracken, M. and Henderson, I. (2000) *Future Skill Needs of Managers*. DfEE Research Report RR182. Nottingham: Department for Education and Employment.