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The Flexible Professional in the Knowledge Society –  
new demands on higher education in Europe (Report 4)

# Competences possessed and required by European graduates

**Report to HEFCE by Centre for Higher  
Education Research and Information, The Open  
University**

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## Executive summary

This report is one of a series of reports commissioned by the Higher Education Funding Council for England which draw on a recent European Commission Framework project: The Flexible Professional in the Knowledge Society – new demands on higher education in Europe (the REFLEX project). The project – undertaken in 11 European countries – was an investigation into the employment experiences of European graduates over the five years since graduation in 2000. By design, the UK sample comprised graduates who had completed a bachelors degree in 2000. In most of the other countries, the samples comprised wholly (or mainly) those with a masters degree.

This report presents a comparative analysis of what competences European and UK graduates report they need to do their current jobs, some five years after graduation, and whether they possess these competences. It also explores activities undertaken during and after higher education that may have contributed to the development of graduates' competences.

The competences rated as highly required by three quarters of all graduates related to:

- Mobilising their own capacities (like using time efficiently, performing well under pressure);
- Mobilising others (working productively with others, coordinating activities, making meaning clear to others);
- Having good specialist knowledge (mastery of own field, ability to rapidly acquire new knowledge).

UK graduates were no different, although they put more emphasis on mobilising their own and others' capacities and less on mastery of own field. This emphasis was evident across different employment sectors.

Overall, graduates considered their levels of competence matched their current job requirements rather well, although around a third felt their ability to perform well under pressure and their foreign language competence was underused.

Around two thirds of all graduates had taken part in work-related training in the past 12 months, as had UK graduates. Graduates working in health and social work were more likely to have done so, but those working in the business sector less likely. In each of the main employment sectors, UK graduates were more likely to have done such training than European graduates overall.

# 1 Introduction

## 1.1 Background

This report is based on the results of a major international study of graduate employment, The Flexible Professional in the Knowledge Society – new demands on higher education in Europe (REFLEX), which was funded by the European Commission as part of its 6<sup>th</sup> Framework programme, Priority 7 Citizens and Governance in a Knowledge-Based Society. The study – undertaken by 11 European countries – was an investigation into the employment experiences of European graduates over the five years following their graduation in 2000. Details of the study are contained in Appendix A.

The main feature of the study was the application of a large questionnaire to nationally representative samples of the graduating population in the participating countries and, through this, the exploration of the kinds of work the graduates had obtained, how well they felt prepared for work, its relationship to their higher education studies, the competences they felt they possessed and were required of them, the nature of the organisations for which they worked, the changes they had experienced over the five years since they had graduated and their values and attitudes to the higher education they had received.

By design, the survey sampled graduates who had completed their studies with either a bachelors or masters degree (or equivalent) depending on whichever qualification was seen as the main 'exit' qualification with which graduates left higher education in 2000 and entered the labour market in each of the respective European countries. In the UK, the sample comprised graduates with a bachelors degree. In most of the other countries, the sample comprised wholly (or mainly) those with a masters degree.

The report is one of six commissioned by the Higher Education Funding Council for England (HEFCE) to draw out the main differences and similarities between the experiences of UK and European graduates. The focus of this report is primarily on graduate competences. Other reports in the series deal with subject differences, age factors, graduates' retrospective views of their higher education and contextual factors. There is also an overview report.

As noted in the report on subject differences, the nature of a graduate's subsequent employment is, in considerable part, a function of the subject studied in higher education. Courses in some subject areas prepare students for quite specific jobs in particular areas of employment. Other courses have a much looser link to the labour market with their graduates dispersed over a wide range of jobs and occupational fields. Moreover, labour markets themselves differ in the extent to which particular educational credentials determine entrance to particular jobs.

But regardless of the nature of such linkages, what is also of interest is what skills and attributes graduates need to do their current jobs and whether such requirements vary (for example, by employment sector or by type of organisation).

## 1.2 Contents

This report presents an analysis of what competences graduates need to do their current jobs, some five years after graduation, and whether they possess these competences. One particular aspect of graduates' current jobs, namely their role in innovation, is also considered to see if such a role requires a particular set of competences. Finally, the report

explores activities undertaken during and after higher education that may have contributed to the development of graduates' competences.

Throughout the report, comparisons are made between UK graduates and all European graduates (i.e., graduates from the 11 countries included in the survey undertaken in spring 2005) and, in some instances, between UK graduates and graduates from selected countries.

All national data have been weighted to be nationally representative in terms of subject of study and institution attended. Figures for all European graduates have been weighted to ensure each country's sample contributes to the overall figure in equal measure. Details of the sample can be found in Appendix B.

Where appropriate, full data on all countries are contained in tables in Appendix C. These tables also provide reference to the question in the survey questionnaire (available to download from the HEFCE web-site).

Where possible, comparisons are made with the findings from an earlier large-scale survey of European graduates, the Higher Education and Graduate Employment in Europe (CHEERS) study of 1994/95 graduates, three to four years after graduation (reported in Brennan et al, 2001; Schomburg and Teichler, 2006; Teichler, 2007).

## 2 What competences do graduates need to do their current jobs?

As the title of the overall study *The Flexible Professional in the Knowledge Society* suggests, there is now an expectation within modern economies that highly qualified workers will have specialised knowledge and skills to carry out professional roles and will be sufficiently flexible to adapt to new challenges in work situations not necessarily related to the field of study they followed in higher education (van der Velden, 2003). But each of these terms is likely to be open to different interpretations. For example, 'knowledge society' has been used in a general way to characterise the general expansion of higher education and knowledge-intensive sectors of the economy, but it is also used to refer to the situation whereby the increasing importance of knowledge is changing the nature of organisations and work tasks (see, for example, Teichler, 1999). The term 'professional' may well have rather different meanings in different countries and in different sectors of employment.

Further, expectations about higher education graduates' expertise can imply notions of the capabilities needed to fulfil a 'professional role', which might include both a mastery of knowledge and skills related to the individual's own area of work and an ability to use such knowledge and skills to diagnose and solve complex problems, together with the ability to command authority and act decisively in uncertain situations. But alongside such notions of professional expertise, it is also argued that dynamic labour markets need highly skilled workers who have the ability to cope with change, to take up new challenges, to rapidly acquire new knowledge and skills (often outside of their own field). Graduates may also be expected to enhance an organisation's capacity to innovate, to develop new products and services and applications – Allen and van der Velden use the phrase 'innovation and knowledge management' to characterise this aspect of graduates' capabilities (Allen and van der Velden, forthcoming). A further demand on graduates is likely to be an ability to work autonomously as well as an ability to work productively with others and more generally to mobilise the capacity of others.

But though such expectations might be clear, there is probably less understanding about the extent to which graduates' jobs actually require such a combination of specialist knowledge and personal attributes and whether graduates are able to fulfil such expectations.

At the time of the survey, some five years after graduation, the vast majority of the graduates were in paid employment (94% overall, 92% of UK graduates) and three quarters (72%) of employed graduates considered their level of education was appropriate to the current job (see Report no. 1 in this series for further details).

In this section of the report on competences we consider graduates' own perceptions of what competences they needed in their current jobs.

Nineteen competences were listed and graduates were asked to indicate the level of competence required in their current work (on a seven-point scale, from one for very low to seven for very high). In Table 1 below we show, for each of the 19 competences, the proportion of graduates indicating that the competence was highly required in their current job.

**Table 1: Graduates' perceptions of required competences, rank ordered by overall, and detailed by country (%; responses 5, 6, 7)**

	All	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Ability to use time efficiently	81	87	81	80	81	86	87	80	84	75	82	76
Ability to perform well under pressure	80	84	79	73	71	88	89	77	81	78	81	81
Mastery of your own field or discipline	78	73	81	71	72	88	86	78	70	77	84	76
Ability to work productively with others	77	85	80	75	73	82	81	78	78	69	78	75
Ability to rapidly acquire new knowledge	76	70	78	71	69	82	82	68	79	64	86	71
Ability to coordinate activities	76	80	75	73	68	84	82	71	75	71	82	73
Ability to make your meaning clear to others	76	82	71	81	81	72	73	78	77	81	78	65
Ability to use computers and the internet	76	75	78	70	60	84	80	66	81	64	88	76
Ability to write reports, memos or documents	71	69	75	68	60	74	73	60	64	68	80	70
Ability to come up with new ideas and solutions	70	64	72	71	60	73	74	71	73	61	74	66
Analytical thinking	69	65	73	58	73	76	73	66	63	49	77	73
Willingness to question your own and others' ideas	65	64	69	58	56	61	64	68	64	59	73	60
Ability to negotiate effectively	60	58	68	56	45	64	61	51	60	45	73	54
Ability to mobilise the capacities of others	60	61	68	58	58	63	64	65	62	58	57	53
Ability to present products, ideas or reports to an audience	59	52	65	56	55	68	66	51	58	49	63	59
Ability to assert your authority	58	62	64	61	60	57	62	52	47	55	66	49
Alertness to new opportunities	57	56	70	49	36	71	67	64	65	59	50	54
Knowledge of other fields or disciplines	45	37	47	41	37	53	51	39	43	35	55	40
Ability to write and speak in a foreign language	43	9	46	31	29	52	41	31	54	30	56	52

Over three quarters of graduates rated the following competences as highly required in their current job:

- Ability to use time efficiently, to perform well under pressure;
- Ability to work productively with others, to coordinate activities and make your meaning clear to others;
- Mastery of own field and ability to rapidly acquire new knowledge;
- Ability to use computers and the internet.

Such requirements lend some weight to the rhetoric of 'flexible professionals': good specialist knowledge and the ability to acquire new knowledge (which could be construed as being adaptable in terms of continually updating one's own knowledge), a professional attitude to mobilising their own capabilities (in terms of using time efficiently and performing well under pressure) and mobilising the capacity of others (in terms of working productively with others, coordinating activities, making your meaning clear to others) were all rated highly by a large majority of the graduates as requirements of their current job.

So we see a requirement for a large majority of graduates to be subject specialists who were flexible and adaptable (in terms of rapidly acquiring new knowledge) and were capable of mobilising their own resources and working well with others.

Other competences rated as highly required by a majority (60% or more) of graduates were:



- Analytical thinking, ability to come up with new ideas, willingness to question your own and others' ideas;
- Ability to mobilise the capacity of others and to negotiate effectively;
- Ability to write reports, memos or documents.

Such competences can be seen as characterising aspects of innovation and knowledge management (for example, ability to come up with new ideas, willingness to question your own and others' ideas) and mobilising others. Thus it seems that graduates need a range of general and arguably transferable skills. But there seemed to be less of a requirement to assert authority and to be a generalist, in terms of having knowledge of other fields or disciplines (with less than half of the graduates rating this requirement highly).

However, we can see from the above table some quite large variations by country and, indeed, the proportion of graduates rating required competences highly seems to be consistently larger in some countries than in others (for example, in Austria, Germany and the Czech Republic over 80% of graduates rated seven of the 19 competences highly – and in six instances it was the same competence).

There were only three competences which UK graduates rated as being required in their current work to a greater extent than the sample overall (a five-percentage-point difference in those rating them highly): using time efficiently, working productively with others and making your meaning clear to others.

On the other hand, lower levels of competence requirement than the whole sample (again based on a five-percentage-point difference in rating) were identified by UK graduates for:

- Mastery of own field, rapidly acquiring new knowledge, knowledge of other fields;
- Coming up with new ideas and solutions;
- Presenting products, ideas or reports to an audience;
- Foreign language competence.

It is difficult to draw any firm conclusions from the above broad-brush comparisons, though it would seem that UK graduates' job requirements tended to emphasise aspects of mobilisation of resources (using time efficiently, working productively with others, making meaning clear to others) more than aspects of professional expertise (in terms of subject knowledge per se). To an extent the UK graduates' slightly lower ratings of job requirements in relation to mastery of own field or discipline fits with the fact that they were also less likely to indicate that exclusively their own or a related field was the most appropriate for their current work (71% compared to 85% overall) and were more likely to say no particular field was most appropriate (19% compared to 8% overall).

It is difficult to make direct comparisons with findings from the previous CHEERS study in relation to graduates' perceptions of their job requirements, given the more detailed manner in which competences (36 in all) were identified in the earlier study (and respondents were asked to rate on a five-point scale) and the fact that in the previous study graduates were surveyed some three years after graduation rather than five years. Nevertheless we can see some similarities in the extent to which the majority of graduates (three quarters or more overall) in both studies rated certain aspects as highly required in their current work:

- Performing well under pressure, using time efficiently;
- Working productively with others, coordinating activities.

However there also seem to be some notable differences, as follows:

- 78% of graduates in the current study rated mastery of own field as highly required, but only 61% of graduates in the previous study rated field-specific theoretical knowledge and field-specific knowledge of methods as highly required;
- 45% of graduates in the current study rated knowledge of other fields or disciplines as highly required, whereas 60% of graduates in the previous study rated cross disciplinary thinking/knowledge as highly required;
- 76% of graduates in the current study rated ability to use computers and the internet as highly required, compared to 65% of graduates in the previous study;
- 59% of graduates in the current study rated ability to present products, ideas or report to an audience as highly required, compared to 84% of graduates in previous study rating oral communication skills;
- 43% of graduates in the current study rated ability to write and speak in a foreign language as highly required, compared to 34% of graduates in the previous study.

Some of these differences may reflect contextual developments in relation to work more generally (for example, the extent to which the use of computers and information technology underpin work tasks) but they are also likely to reflect the differing length of time since graduation and the possibility that the jobs of graduates in the current study (some five years after graduation) were demanding a slightly different skills mix than those required by graduates in the previous study (three to four years after graduation), particularly with respect to subject-specific knowledge.

The similarities and differences between UK graduates' ratings of highly required competences in this study and the previous study mirrored those noted above in respect of the overall sample.

## **2.1 Do requirements for competences vary by sector of employment?**

A further comparison of competences required in graduates' current work can be made by looking at sectors of employment.

The main sectors in which graduates in the sample were employed five years after graduation were:

- Real estate, renting and business activities (18%);
- Education (18%);
- Health and social work (16%);
- Manufacturing (12%);
- Public administration and defence, and compulsory social security (9%).

(see Appendix C, Table A1 for detail)

There were some quite large differences in the spread of graduates between economic sectors by country (for example, 29% of Italian graduates are working in real estate, renting and business activities compared to just 18% overall; 25% of French graduates are working in health and social work compared to just 16% overall). As far as the UK graduates are concerned, we see that they were much less likely than graduates from some other countries to be working in manufacturing (9% compared to 18% of Finnish graduates and 16% of Czech graduates). On the other hand, the general pattern of work by economic sector was similar for UK graduates and Europe overall in that the main sectors in which UK graduates were employed were the same as the overall sample.

When we look at graduates' ratings of required competences by main economic sector (Table 2 below) we see a certain amount of variation, although the rankings in each of the main economic sectors tend to follow a similar pattern to each other and to the rankings for the overall sample. The table below presents the information, by main economic sector, for all graduates and for UK graduates. (See Appendix C, Table A2, A3, A4, A5 and A6 for required competences by main economic sector and country).

**Table 2: Graduates' ratings of highly required competences, rank ordered by overall and detailed by main economic sector (overall and UK)**

	All	Real estate and business		Education		Health and social work		Manufacturing		Public admin	
		All	UK	All	UK	All	UK	All	UK	All	UK
Ability to use time efficiently	81	84	88	80	91	82	87	83	83	74	83
Ability to perform well under pressure	80	84	89	71	84	80	80	84	81	76	84
Mastery of your own field or discipline	78	80	75	81	78	82	68	76	68	77	68
Ability to work productively with others	77	80	83	74	89	80	87	80	80	70	83
Ability to rapidly acquire new knowledge	76	82	74	75	72	70	70	78	67	74	66
Ability to coordinate activities	76	77	82	78	85	74	80	79	77	70	74
Ability to make your meaning clear to others	76	77	84	78	87	74	85	76	76	74	77
Ability to use computers and the internet	76	87	83	73	80	59	56	84	73	75	74
Ability to write reports, memos or documents	71	77	73	72	76	65	63	71	58	80	74
Ability to come up with new ideas and solutions	70	75	67	74	72	61	52	76	68	59	52
Analytical thinking	69	77	73	65	57	61	61	75	67	68	57
Willingness to question your own and others' ideas	65	67	63	68	69	60	60	69	64	57	54
Ability to negotiate effectively	60	63	58	52	53	54	60	62	60	60	59
Ability to mobilise the capacities of others	60	60	54	62	69	61	64	61	56	50	57
Ability to present products, ideas or reports to an audience	59	64	54	68	65	48	45	58	44	55	47
Ability to assert your authority	58	55	55	67	79	56	64	56	44	55	59
Alertness to new opportunities	57	63	57	55	57	54	55	60	51	43	48
Knowledge of other fields or disciplines	45	48	38	44	39	40	36	47	29	46	36
Ability to write and speak in a foreign language	43	49	10	42	12	25	5	63	9	29	6

### Real estate, renting and business activities

First we consider graduates working in real estate, renting and business activities. The competences rated as highly required by three quarters of these graduates matched those highly rated by the overall sample. Additionally, analytical thinking, coming up with new ideas or solutions and writing reports were highly rated by three quarters of all graduates working in real estate and business.

The required competences highly rated by UK graduates working in this sector were similar to the overall picture for this sector but we should note that certain aspects, including using

time efficiently, performing well under pressure, making meaning clear to others and coordinating activities were particularly highly rated by UK graduates. Further, the ability to rapidly acquire new knowledge and to come up with new ideas or solutions were slightly less highly rated (74% and 67% respectively, compared to 82% and 75% for all graduates working in this sector).

### Education

Turning to graduates working in the education sector, once again we see similarities with the ratings for the overall sample. The only competences much more likely to be highly rated by graduates working in education compared to graduates overall were (perhaps not surprisingly) the ability to present products, ideas or reports to an audience and the ability to assert authority. However, it is likely that for many graduates working in this sector, the context for asserting authority was authority over pupils, rather than the ability to command authority (presumably among other work colleagues) that we noted earlier as one of a number of capabilities cited as necessary to fulfil a professional role. Those working in education were also slightly less likely than the sample overall to rate ability to perform under pressure and to negotiate effectively as highly required competences though a majority still rated them highly (71% and 52% respectively).

Whilst UK graduates working in education matched the overall education picture to some extent, they were also much more likely to stress certain aspects of mobilisation of resources (working with others, coordinating activities, making meaning clear to others, mobilising the capacity of others and using time effectively) as highly required. Additionally, they were much less likely to rate analytical thinking, knowledge of other fields and foreign language competence as highly required.

### Health and social work

The competences rated as highly required by three quarters of graduates working in the health and social work sector matched (more or less) those highly rated by the overall sample – the main exception being the ability to use computers and the internet (rated as highly required by only 59% of these graduates compared to 76% overall).

UK graduates working in this sector largely matched the overall health and social work picture, though we should note that UK graduates were much less likely to rate mastery of own field as a highly required competence (68% compared to 82% of all graduates working in the sector). On the other hand, UK graduates were more likely to rate asserting your authority as highly required (64% compared to 56%).

### Manufacturing

Turning to graduates working in the manufacturing sector, we see that the competences rated as highly required by three quarters of them matched those highly rated by the overall sample. Additionally, certain aspects of professional expertise (in the form of analytical thinking) and of innovation and knowledge management (in the form of the ability to come up with new ideas or solutions) were also rated as highly required by three quarters of graduates working in manufacturing. We should also note that, overall, such graduates were much more likely than any others to rate foreign language competence as highly required (63% of these graduates, compared to just 43% overall).

However, for UK graduates working in manufacturing, the set of highly required competences rated by three quarters (or more) of such graduates shows a slightly different pattern. In particular, UK graduates were slightly less likely to rate aspects of professional expertise (mastery of own field, analytical thinking), functional flexibility (rapid acquisition of new

knowledge) and innovation and knowledge management (coming up with new ideas) as highly required – though they were highly rated by two thirds of UK graduates.

### Public administration

The final main economic sector covers public administration. Once again we see that the competences rated as highly required by three quarters of graduates were very similar to those highly rated by the overall sample. Just slightly less than three quarters (70%) rated working productively with others and coordinating activities as highly required. On the other hand, the vast majority (80%) rated the ability to write reports, memos or documents as highly required (compared to 71% overall).

However, for UK graduates working in this sector, the set of competences rated as highly required by about three quarters of them showed a slightly different pattern. In particular, UK graduates were slightly less likely to rate aspects of professional expertise (mastery of own field) and of functional flexibility (rapid acquisition of new knowledge) as highly required – though these competences were highly rated by two thirds of UK graduates working in this sector.

To summarise, we see that though there is some variation between the main sectors of employment, by and large the overall pattern of highly required competences was similar. However, we can also see that, almost regardless of employment sector, UK graduates were more likely to rate aspects of mobilisation of resources as highly required in their current jobs, and less likely to rate aspects of professional expertise and functional flexibility as highly required. (See Reports no. 1 and no. 3 in this series for further details of graduates' jobs).

It is also noteworthy that less than half of all the graduates in the sample rated knowledge of other fields and foreign language competence as highly required in their current jobs. As we can see from Table 2 above, in each of the five main economic sectors considered, UK graduates were much less likely than graduates overall to rate such competences as highly required.

## **2.2 Variation in required competences between private and public sector employment**

In this section, we compare the requirements of those graduates working in the private sector with those working in the public sector.

Half of all the respondents currently employed were working in the private 'for profit' sector and four in ten were working in the public sector, with the remainder working in the private not-for-profit sector (see Table A7 for detail). UK graduates were slightly less likely to be working in the private 'for profit' sector (43%) and more likely to be working in the public sector (49%).

In Table 3 below, we look at graduates' ratings of highly required competences in the two main sectors, private 'for profit' and public.

**Table 3: Graduates' ratings of highly required competences, rank ordered by overall, and detailed by type of organisation (overall and UK)**

	All	Private 'for profit'		Public	
		All	UK	All	UK
Ability to use time efficiently	81	83	85	78	89
Ability to perform well under pressure	80	84	84	75	85
Mastery of your own field or discipline	78	77	71	79	76
Ability to work productively with others	77	78	81	76	88
Ability to rapidly acquire new knowledge	76	78	69	73	71
Ability to coordinate activities	76	77	76	74	82
Ability to make your meaning clear to others	76	76	81	75	83
Ability to use computers and the internet	76	81	75	71	74
Ability to write reports, memos or documents	71	69	64	72	72
Ability to come up with new ideas and solutions	70	72	65	66	61
Analytical thinking	69	72	70	65	61
Willingness to question your own and others' ideas	65	65	64	63	63
Ability to negotiate effectively	60	65	59	53	59
Ability to mobilise the capacities of others	60	60	56	58	65
Ability to present products, ideas or reports to an audience	59	58	48	59	54
Ability to assert your authority	58	58	56	58	68
Alertness to new opportunities	57	60	55	52	57
Knowledge of other fields or disciplines	45	46	34	43	39
Ability to write and speak in a foreign language	43	50	10	35	7

There was little variation in the set of competences rated as highly required by three quarters (or more) of all graduates working in the private 'for profit' sector and their counterparts working in the public sector. Those working in the public sector were less likely than those in the private 'for profit' sector to rate as highly required competences the ability to use computers and the internet (71% compared to 81%); the ability to negotiate effectively (53% compared to 65%) and alertness to new opportunities (52% compared to 60%).

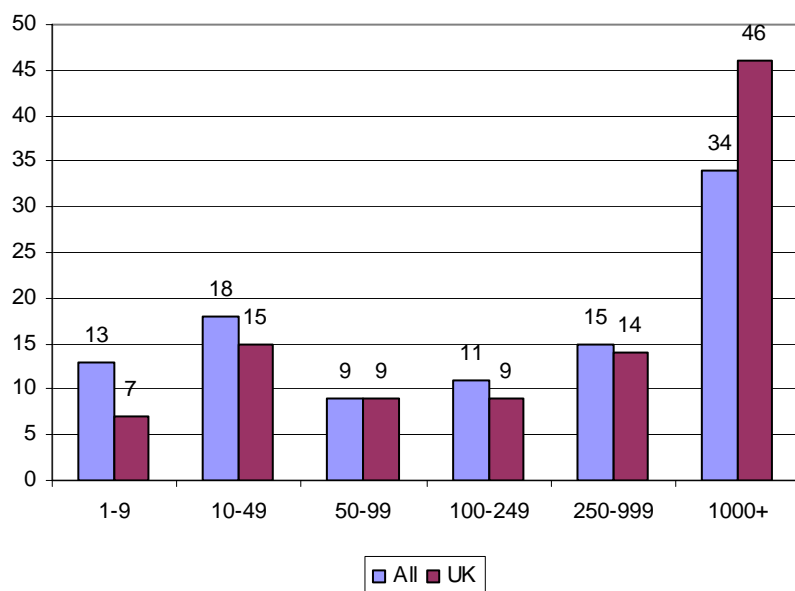
However, in the private 'for profit' sector, we see some differences in the set of competences rated as highly required by UK graduates and by the overall sample. In particular, the competences rated as highly required by three quarters (or more) of UK graduates did not include mastery of own field (71% compared to 77% overall) and ability to rapidly acquire new knowledge (69% compared to 78% overall). Other competences less likely to be rated by private sector UK graduates as highly required were coming up with new ideas and solutions (65% compared to 72% overall), negotiating effectively (59% compared to 65% overall), presenting products, ideas or reports to an audience (48% compared to 58% overall) and (as noted elsewhere) knowledge of other fields and foreign language competence (34% compared to 46%; and 10% compared to 50%, respectively).

Turning to graduates working in the public sector, there was no difference in the set of competences rated as highly required by three quarters (or more) of UK graduates and graduates overall. However, as we can see from Table 3 above, public sector UK graduates were much more likely than graduates overall to rate aspects of mobilising resources as highly required, in particular using time efficiently and working productively with others (89% and 88% respectively, compared to 81% and 77% for the sample overall). They were also more likely to rate the ability to assert their authority as highly required (68% compared to 58% overall).

## 2.3 Do required competences vary by size of organisation?

The distribution of graduates' current jobs by size of organisation is shown in Figure 1 below.

**Figure 1: Graduates' current jobs, by size of organisation (number of employees), overall and UK (%)**



As we see, UK graduates were more likely than graduates overall to be working in very large organisations with 1,000+ employees (46% compared to 34% overall) and less likely to be working in micro-businesses of just one to nine employees (7% compared to 13% overall).

We might expect that graduates' ratings of highly required competences would vary by size of organisation, particularly where graduates were employed in small organisations (49 employees or less). In the table below, we focus on these graduates and show their ratings of highly required competences (ratings for graduates overall shown again, for comparison). Table A13 in Appendix C shows listing for each size of organisation.

**Table 4: Graduates' ratings of highly required competences, rank ordered by overall and detailed by size of small organisation (overall and UK)**

	All	UK	1-9 employees		10-49 employees	
			All	UK	All	UK
Ability to use time efficiently	81	87	80	89	81	85
Ability to perform well under pressure	80	84	79	81	79	78
Mastery of your own field or discipline	78	73	77	75	78	68
Ability to work productively with others	77	85	75	82	77	82
Ability to rapidly acquire new knowledge	76	70	74	71	75	68
Ability to coordinate activities	76	80	76	83	76	77
Ability to make your meaning clear to others	76	82	75	85	75	80
Ability to use computers and the internet	76	75	75	73	75	68
Ability to write reports, memos or documents	71	69	68	65	71	66
Ability to come up with new ideas and solutions	70	64	70	69	68	55
Analytical thinking	69	65	65	57	66	58
Willingness to question your own and	65	64	64	60	64	59

others' ideas						
Ability to negotiate effectively	60	58	66	65	59	57
Ability to mobilise the capacities of others	60	61	59	54	59	61
Ability to present products, ideas or reports to an audience	59	52	60	52	57	47
Ability to assert your authority	58	62	57	59	57	59
Alertness to new opportunities	57	56	62	59	55	51
Knowledge of other fields or disciplines	45	37	46	38	45	36
Ability to write and speak in a foreign language	43	9	37	13	39	5

Looking at the picture overall, graduates working in micro-businesses (one to nine employees) rated highly required competences in a very similar manner to all graduates in the sample.

The main differences (five percentage points or more) were that the former were more likely than graduates overall to rate the following as highly required:

- Ability to negotiate effectively (66% compared to 60% overall);
- Alertness to new opportunities (62% compared to 57% overall).

There were no differences in the ratings of highly required competences between graduates working in small organisations (10-49 employees) and graduates overall.

However, when we look at UK graduates in comparison with all graduates working in these organisations, we can discern rather more differences.

In particular, UK graduates working in micro-businesses were more likely to rate several aspects of mobilising resources as highly required than all graduates working in such organisations, as follows:

- Ability to use time efficiently (89% compared to 80%);
- Ability to work productively with others (82% compared to 75%);
- Ability to coordinate activities (83% compared to 76%);
- Ability to make meaning clear to others (85% compared to 75%).

They were less likely to rate as highly required:

- Analytical thinking (57% compared to 65%);
- Ability to mobilise the capacity of others (54% compared to 59%);
- Ability to present products, ideas or reports to an audience (52% compared to 60%).

With the exception of the ability to coordinate activities, these higher levels of competence requirement mirrored the overall differences found between UK graduates and graduates overall (see page 9).

However the lower levels of requirements with respect to analytical thinking and mobilising the capacity of others (in comparison to all graduates working in micro-businesses) varied somewhat from the lower levels of competence requirement identified by UK graduates overall.

Turning to UK graduates working in small organisations (10-49 employees), we can see that in general they were less likely to rate competences as highly required than all graduates working in the same sized organisations (and for nine out of 19 competences the ratings showed a five-percentage-point difference or more). In only two instances, working productively with others and making meaning clear to others (both aspects of mobilising resources), were UK graduates more likely to rate these as highly required than all graduates



working in small organisations. Once again, these higher levels mirrored the overall differences found between UK graduates and all graduates.

One final comment is worth making before leaving this section of graduates' perceptions of competences required in their current jobs, and that is in relation to foreign language competence. In the UK, there continue to be concerns expressed, particularly by employers, about the lack of language skills among young people (and others) and the negative impact this has on the UK economy (see, for example, Hodson, 2006; DfES, 2006). But as we see from the above, less than one in ten UK graduates rated foreign language competence as highly required in their current job. On a scale of one to seven (where one equates to 'very low), UK graduates' mean rating of the requirement for foreign language competence was only 1.9, compared to a mean rating of 3.9 for the whole sample. So even though UK employers (in particular) may be expressing concerns about the lack of foreign language competence among employees, the evidence from our survey seems to suggest that UK graduates did not perceive foreign language competence as being particularly highly required in their current jobs.

### 3 To what extent do graduates' own competences meet their job requirements?

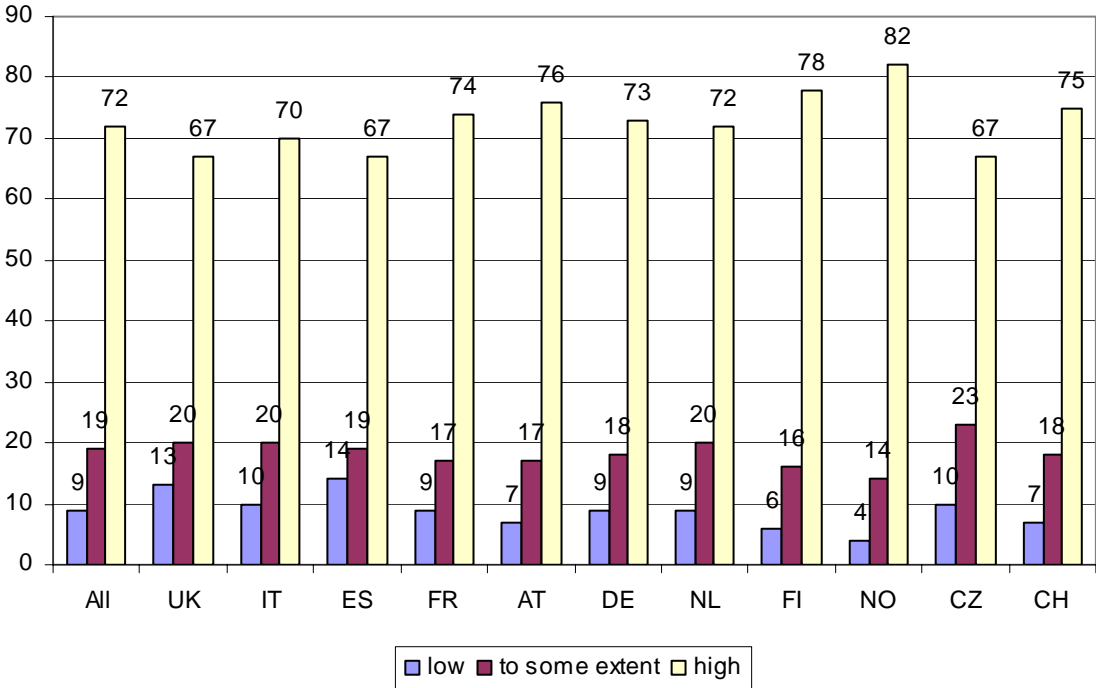
In the above section we looked at what competences graduates' considered were required in their current jobs. In this next section, we look at the extent to which there was a match between such requirements and the competences possessed by graduates.

Any discussion of matches (and mis-matches) of competence can be seen as a dimension in debates about economic productivity.

Skills, innovation, investment, enterprise and competition have been identified as the main drivers of productivity (Tether et al, 2005). Of particular concern to the UK government is the continuing productivity gap with some of its main competitors, including France and Germany in mainland Europe (see, for example, the Leitch Review, 2006). Our study cannot shed light on many of these drivers, but it can provide some information about how UK graduates compare with other graduates in Europe in terms of having the skills needed in their current jobs. It can also provide some information about the extent of innovation in their organisations and their level of involvement in innovation (see Section 4).

A rather simple way of considering graduates' current work requirements in relation to their own competences is the extent to which they consider their knowledge and skills are used in their current work. Graduates were asked to rate such usage on a scale of one to five ('not at all' to 'to a very great extent'). In Figure 2 below we show graduates' ratings in three main categories: low/not at all (one or two), to some extent (three) or to a large extent (four or five).

**Figure 2: Utilisation of knowledge and skills in current work, by country (%)**



In each country, including the UK, two thirds or more graduates considered they were using their knowledge and skills to a large extent in their current work. This proportion rose to three quarters of graduates in Austria, Finland, Norway and Switzerland.

Graduates were also asked to rate the extent to which their current work needed more knowledge and skills than they could offer (again, on a scale of one to five). In some ways, this question was aiming to gauge the extent of any deficit between job demands and what graduates could supply. Although the majority of graduates considered their current job did not need more knowledge and skills than they could offer (or only to some extent), a quarter of all graduates (23%) felt their jobs required much more knowledge and skills than they could offer and 26% of UK graduates did so. Further analysis would be required to ascertain whether there were any particular characteristics common to this group of graduates (for example, in terms of socio-biographic and higher education background; sector of employment).

Whilst such a broad-brush look at graduates' perceived gaps between their own knowledge and skills and those required in their current work is of interest, a more detailed picture of the relationship between supplied and demanded competences in the graduate labour market can be provided by considering graduates' ratings of their own competences and the extent to which they considered these same competences were required in their current work.

### 3.1 Surpluses and deficits in graduates' knowledge and skills

In this section we look at surpluses and deficits in graduate competences for the sample overall and then compare the situation for UK, French and German graduates.

A surplus is when a competence possessed by a graduate is not required by the employer to more or less the same extent. A deficit is when a graduate faces higher requirements than he or she possesses. A balance is when competence requirements are more or less matched by competences currently possessed by the graduate. Charts C1, C2, C3 and C4 in Appendix C provide the differentiation between large and small surpluses and large and small deficits for all graduates, as well as for graduates in the UK, France and Germany. The following describes the proportion of graduates facing surpluses or deficits.

Table 5 below shows the ten most common surpluses.

**Table 5: Ten most common surpluses in competences, overall and for UK, France and Germany**

All	UK	France	Germany
1 Performing well under pressure	1 Performing well under pressure	1 Performing well under pressure	1 Performing well under pressure
2 Foreign language competence	2 Foreign language competence	2 Use of computers and the internet	2 Foreign language competence
3 Questioning ideas	3 Writing reports, memos, documents	3 Foreign language competence	3 Questioning ideas
4 Alertness to new opportunities	4 Questioning ideas	4 Alertness to new opportunities	4 Knowledge of other disciplines
5 Use of computers and the internet	5/6 Use of computers and the internet; Presenting products, ideas, reports	5 Knowledge of other disciplines	5 Presenting products, ideas, reports
6 Knowledge of other disciplines	7/8 Alertness to new opportunities; Knowledge of other disciplines	6 Acquiring new knowledge	6 Use of computers and the internet
7 Presenting products, ideas, reports		7 Writing reports, memos, documents	7 Mobilising others
8 Writing reports, memos, documents		8 Questioning ideas	8 Negotiating effectively
9 Acquiring new knowledge	9 Acquiring new knowledge	9 Coming up with ideas and solutions	9 Writing reports, memos, documents
10 Coming up with ideas and solutions	10 Coming up with ideas and solutions	10 Presenting products, ideas, reports	10 Asserting authority

Perhaps rather surprisingly, there were no differences between the top ten lists of surpluses for graduates overall, graduates in the UK and graduates in France. The list for Germany was also very similar.

The proportion of graduates overall perceiving surpluses was quite large (see Chart C1 for detail). The main surpluses, identified by almost a third of all graduates, were in their capacity to perform well under pressure, and their foreign language competence (31% and 29% respectively). Additionally, around a fifth of all graduates (18-19%) perceived surpluses relating to:

- Innovation and knowledge management (questioning ideas, alertness to new opportunities, use of computer and the internet);
- Functional flexibility (knowledge of other disciplines, acquiring new knowledge);
- Communication capabilities (writing reports, presenting products, ideas, reports).

So it would seem that for a fifth (or more) of graduates, employers were not necessarily tapping in to the graduates' full range of capabilities.

Turning to the issue of deficits, we show the ten most common deficits in Table 6 below.

**Table 6: Ten most common deficits in competences, overall and for UK, France, Germany**

All	UK	France	Germany
1 Using time efficiently	1 Using time efficiently	1 Asserting authority	1 Using time efficiently
2 Asserting authority	2 Mastery of own discipline	2 Mastery of own discipline	2 Asserting authority
3 Negotiating	3 Asserting authority	3 Making meaning clear to others	3 Negotiating
4 Mastery of own discipline	4 Negotiating	4 Using time efficiently	4 Presenting products, ideas, reports
5 Presenting products, ideas, reports	5 Making meaning clear	5 Negotiating	5 Foreign language competence
6 Mobilising others	6 Presenting products, ideas, reports	6 Foreign language competence	6 Mobilising others
7 Making meaning clear	7 Mobilising others	7 Mobilising others	7 Making meaning clear
8 Foreign language competence	8 Knowledge of other disciplines	8 Presenting products, ideas, reports	8 Alertness to new opportunities
9 Knowledge of other disciplines	9 Alertness to new opportunities	9 Coming up with ideas and solutions	9 Mastery of own discipline
10 Alertness to new opportunities	10 Coming up with ideas and solutions	10 Working with others	10 Knowledge of other disciplines

Overall, a much smaller proportion of graduates overall perceived deficits. The biggest deficit for graduates overall was in using time efficiently (affecting 15% of all graduates) and only 9% of all graduates perceived a deficit in being alert to new opportunities. As with surpluses, there was little difference in the lists of top ten deficits between the overall sample and the UK, France and Germany samples. The top ten list for UK graduates differed from the overall list (and that for Germany) in only one respect: coming up with ideas or solutions replaces foreign language competence in the UK listing (see Charts C2, C3 and C4 in Appendix C for detail).

Although graduates perceiving deficits represent only a minority of the graduates overall, certain aspects of professional expertise (in the shape of asserting authority and mastery of own discipline) were among these competence deficits.

The above notions of surpluses and deficits are helpful in considering the extent of a match (or mis-match) between graduates' perceptions of their own competences and of the requirements of their current work. However, the above analysis does not take into account

many aspects of the graduates' jobs, for example, the level and nature of their own work, the sector in which they are working and the size of organisation. Further analysis would be required to look at these and other aspects in more detail (for example, highest level of current qualification and extent of work-related training), to ascertain whether there are any particular patterns to the mis-matches outlined above.

However, at this broad level of analysis, it would seem that there was little difference between UK graduates' perceptions of surpluses and deficits and the perceptions of graduates overall, and of their French and German counterparts in particular. Thus, notwithstanding the completion of other academic programmes in addition to the higher education completed in 1999/2000 (see later section nine for detail of additional education and training), it would seem that the UK graduates in our sample – who, in the main, had a bachelors degree as their highest level of qualification – experience similar surpluses and deficits as the European graduates in the sample – who, in the main, had a masters degree (or equivalent) as their highest level of qualification.

# 4 Graduates' jobs and innovation

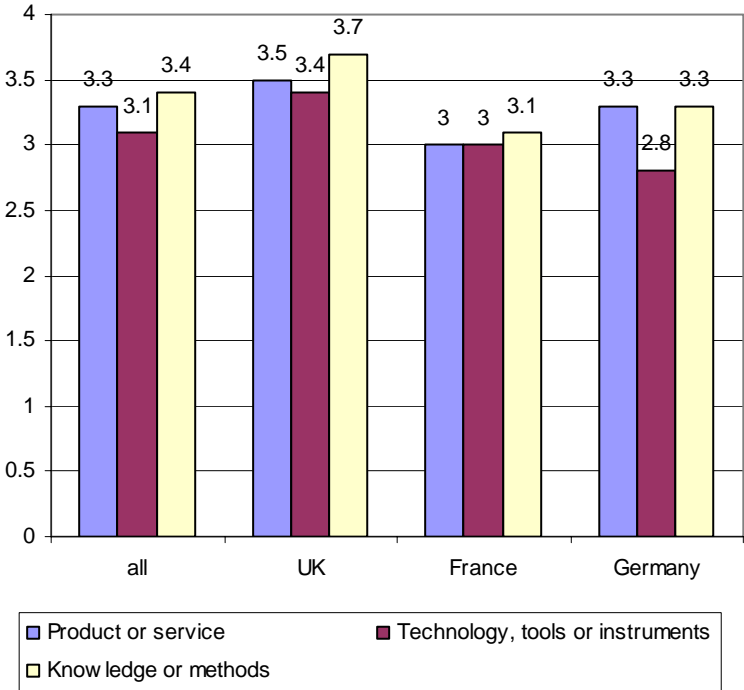
Considerations of the links between higher education and the labour market, and of graduates' skills and competences, fall within a much wider range of issues to do with economic prosperity and productivity. Considerations of matches and mis-matches between requirements for competences in particular jobs can be seen as just a part of these considerations. As noted above, level of innovation within organisations is another key driver in economic productivity and prosperity.

Given a particular concern of the UK government is the continuing productivity gap with some its main competitors, including France and Germany, in this section we consider levels of innovation in graduates' organisations for the sample overall and then for the UK, France and Germany.

In the REFLEX survey, innovation within the graduates' current organisation was looked at along three different dimensions: product or service, technology, tasks or instruments and knowledge or methods.

Graduates' mean ratings of the extent of innovation in relation to these three dimensions are shown in Figure 3 below.

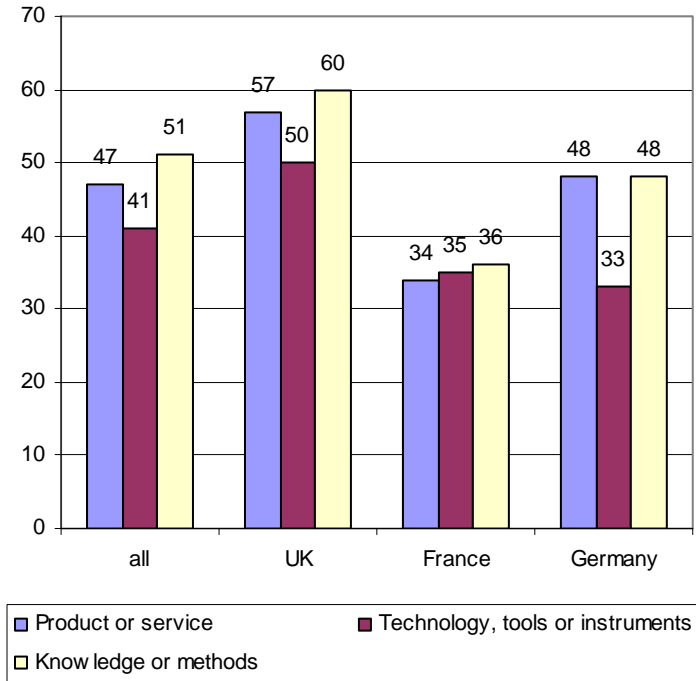
**Figure 3: Graduates' average ratings of extent of innovation in each dimension, overall and UK, France and Germany**



For each dimension of innovation, UK graduates tended to rate the extent of innovation within their organisation slightly higher than graduates overall.

We can look at this variation in slightly more detail by considering the proportion of graduates indicating a high level of innovation (rating four or five).

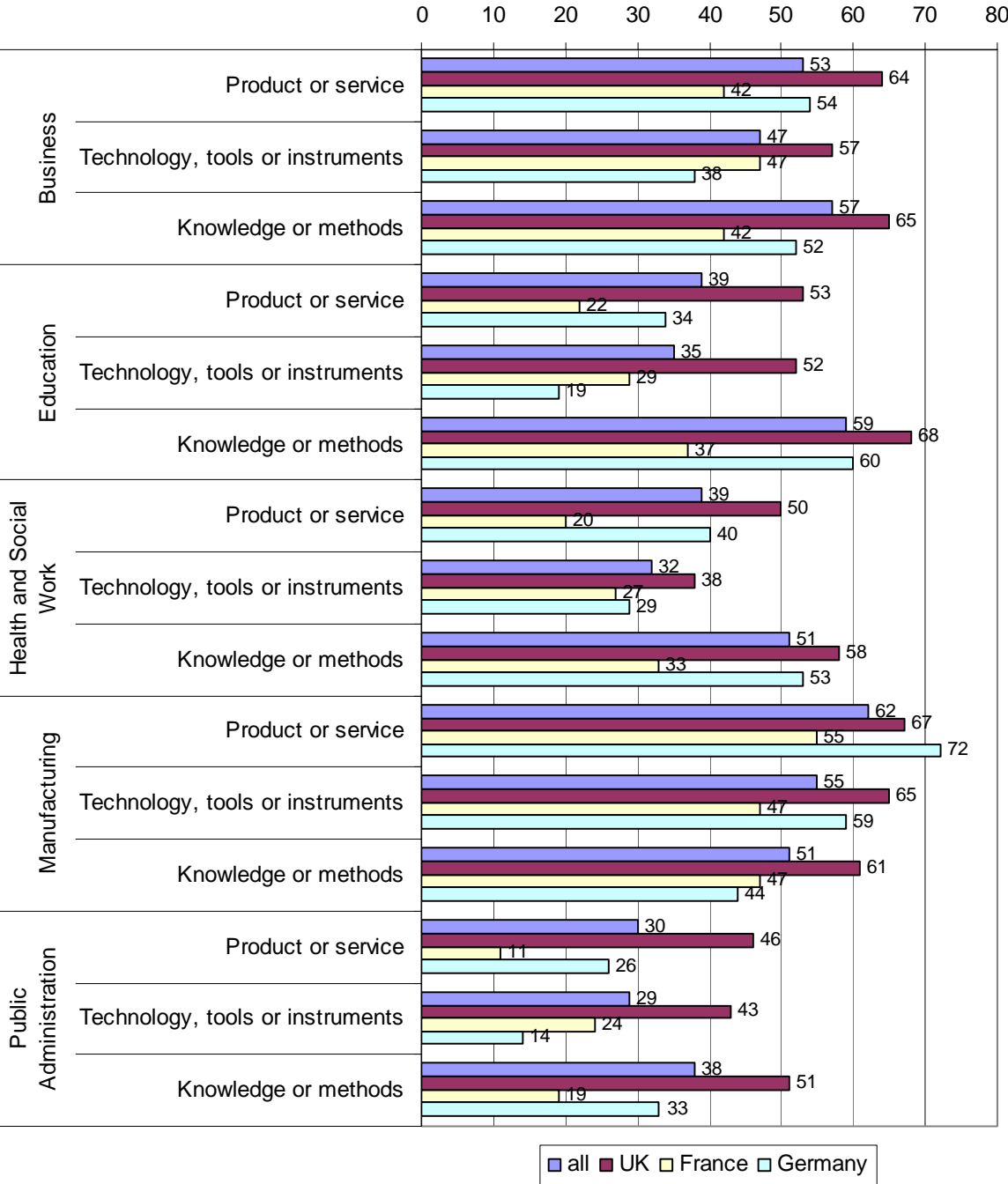
**Figure 4: Graduates' ratings of high level of innovation, overall and UK, France and Germany (% responses four or five)**



As can be seen from Figure 4 above, for each aspect of innovation (product or service, technology, tools or instruments and knowledge or methods) UK graduates were much more likely than all graduates (and graduates in France and Germany) to indicate there was a high level of innovation in their organisation. Without further investigation, it is not possible to assess whether these rather large differences reflect primarily differences in understanding and usage of the term 'innovation' in the different countries, rather than actual differences in levels of innovation.

But regardless of differences in country-specific interpretations, it is also likely that levels of innovation will vary by sector of employment and type of organisation. In the next sections, we consider graduates' ratings of the level of innovation in each of the five main sectors of employment and by type of organisation (private or public sector).

**Figure 5: Graduates' ratings of high level of innovation by employment sector, overall and UK, France and Germany (% , responses four or five)**



As can be seen from Figure 5, for each of the main sectors of employment (except public administration), half (or more) of the graduates indicated high levels of innovation with respect to knowledge or methods. However, there was much greater variation between sectors in terms of innovations in product or service and in technology, tools or instruments. Perhaps not surprisingly, graduates working in the business and in the manufacturing sectors were much more likely than those working in the other main sectors to indicate high levels of innovation within their organisations. Sixty-two per cent of graduates working in manufacturing and 53% of those working in business indicated high levels of innovation in product or service, compared to only 39% of graduates working in education and health and social work and only 30% of those working in public administration.



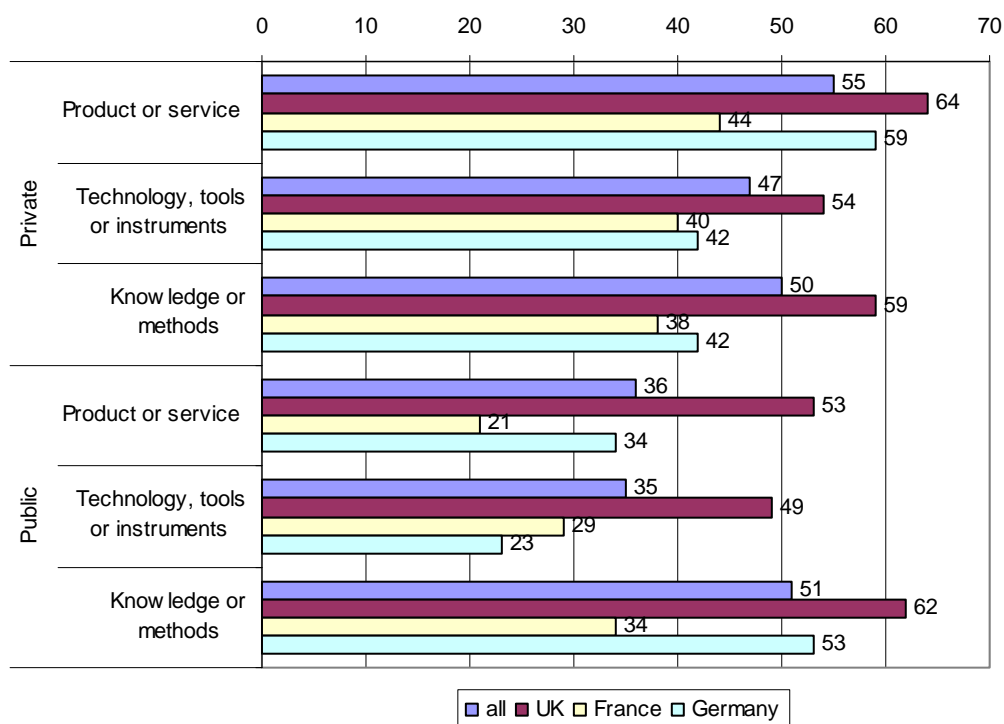
Graduates working in manufacturing were also (not surprisingly) the most likely to rate high levels of innovation with respect to technology, tools or instruments (52% did so).

We can also see from Figure 5 that in all of the main sectors of employment and all of the three dimensions (except in manufacturing, product or service) UK graduates were more likely than others to indicate a high level of innovation. The variation was particularly strong in education. Given the increasingly ‘service sector’ nature of the UK economy, it could be argued that high levels of innovation are required within various sectors of the economy to ensure competitiveness. In fact, more detailed analysis of all graduates’ ratings of levels of innovation by the strength of competition faced by their organisation (reported by Paul, forthcoming) shows a strong correlation between high levels of innovation (for each of the three aspects of innovation) and high levels of competition faced by the organisation.

However, the fact that UK graduates were more likely than graduates overall to indicate high levels of innovation in each of the five main sectors of employment, which, with the exception of business, might not be considered service sectors, seems to suggest other reasons for these findings.

Finally, given the relationship between levels of innovation and strength of competition noted above, we might expect to find some variation in the level of innovation rated by graduates working in private sector as opposed to public sector organisations: Figure 6 below provides the detail.

**Figure 6: Graduates’ ratings of high level of innovation, by type of organisation, overall and UK, France and Germany (% , responses four or five)**



As we see, graduates working in private ‘for profit’ organisations were much more likely to indicate high levels of innovation in product or service and in technology, tools or instruments than those working in public sector organisations. Nevertheless, about a third of all graduates working in public sector organisations rated high levels of innovation with respect to technology, tools or instruments and to product or service. Perhaps surprisingly, there was no difference between private and public sector in the proportion of graduates rating high

levels of innovation with respect to knowledge or methods. In each type of organisation, half of graduates rated high levels of innovation.

Once again, irrespective of type of organisation and dimension of innovation, UK graduates were much more likely than either French or German graduates to indicate high levels of innovation within their organisation.

## 5 Graduates' own role in introducing innovations

In the above section we have seen that graduates' perceptions of the extent of innovation within the different employment sectors varied. But regardless of whether they considered there was a high level of innovation within their organisation, their own level of involvement in introducing innovation was also likely to vary.

Overall, graduates were much more likely to indicate they had a role in introducing innovations in knowledge or methods (61%) than in the other two aspects of innovation (47% product or service, 35% technology, tools or instruments).

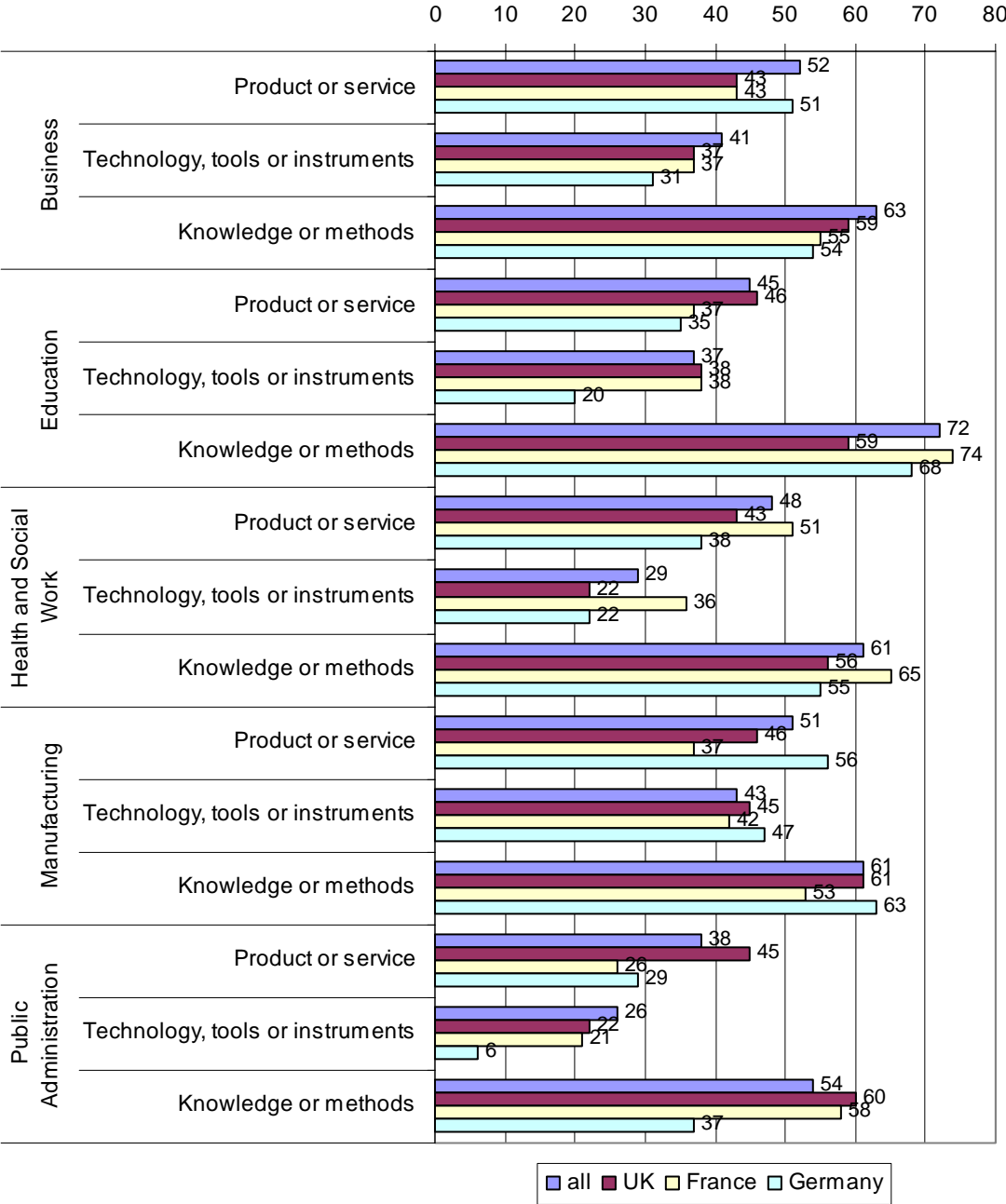
In Figure 7 below, we consider graduates' roles in introducing innovations by the five main sectors of employment.

In terms of introducing innovation in knowledge or methods, almost three quarters of graduates working in education (72%) indicated they had such a role, compared to just over half (54%) of those working in public administration.

Just under half of all graduates said they had a role in introducing innovations in product or service: those working in business or manufacturing were most likely to do so (52% and 51% respectively) and those in public administration were least likely (38%).

In terms of innovations in technology, tools or instruments, about a third of all graduates indicated they played a role in introducing such innovations: again, those working in business or manufacturing were most likely to do so (41% and 43% respectively). Those working in health and social work or in public administration were least likely to do so (29% and 26% respectively).

**Figure 7: Proportion of graduates having a role in introducing innovations, by main sector of employment and type of innovation, overall and UK, France and Germany (%)**



When we consider UK graduates’ roles in introducing innovations in comparison to graduates overall, in each of the five main sectors of employment we see little overall pattern emerging with respect to each aspect of innovation. Within health and social work, it seems that UK graduates were less likely than graduates overall to play a role in introducing innovation in each of the three aspects. But in public administration, UK graduates were more likely than graduates overall to play a role in introducing innovations in product or service and in knowledge or methods, but less likely to do so in respect of innovations in technology, tools or instruments.

More detailed analysis of graduates’ roles in introducing innovations, and in particular the relationship between such roles and graduates’ networking activities (reported by Paul, forthcoming), shows that, irrespective of the type of innovation, those who played a role in

introducing innovation were much more likely to engage in active networking outside their organisation than those who did not play such a role (70% compared to 50%).

However, further analysis would be required to ascertain to what extent other aspects of the graduates' current employment might be conducive to them having a role in introducing innovation; to what extent the incidence of graduates' own role in introducing innovations varied by the overall level of innovation within their organisation and to what extent graduates' overall values and orientations to work were related to the likelihood of playing a role in introducing innovations in work.

## 6 Competences required to support innovation

A recent UK literature review on skills and innovation (Tether et al, 2005) concludes: ‘There is no one mix of skills that is conducive to good innovation performance in all circumstances. Instead, the required skills vary across the type of innovation concerned, the industry and the strategic model the firm pursues’ (ibid, p. 6). The review notes that for older models of (technological) innovation, the skills needed are the degree- and higher-level science and engineering skills of a small elite in the organisational hierarchy. More recent models (such as systemic integration) allow for more democratic, distributed sources of innovation involving the skills of the whole workforce. These models emphasise the importance of interaction and cooperation between all involved in the process, including suppliers, partners and customers. Such interactions require communication and negotiation skills (see earlier reference to networking in Section 5). Management and leadership skills are also identified as important for all types of innovation (though the literature review notes there is little empirical evidence about how management skills relate to innovation). Finally intermediate-level technical skills (not the subject of the REFLEX study) are thought to be important for innovation, especially in manufacturing.

In this final section on innovation, we consider if there is anything distinctive about the competences of graduates who had a role in introducing an innovation in their organisation compared with graduates overall. As we see from Section 5 above, graduates working in business and in manufacturing seemed more likely than those working in other sectors to have a role in introducing innovation in two of the three aspects.

Thus, in this section we take just one sector, manufacturing, and look at each aspect of innovation in turn: product or service, technology, tools or instruments and knowledge or method.

In Tables 7-9 below, we show the top ten highly required competences for graduates working in manufacturing and having a role in introducing innovations in product or service, technology, tools or instruments and knowledge or methods respectively (Tables A10-A12 in Appendix C provide the detailed ratings.).

### 6.1 Innovation in product or service

**Table 7: Ten most highly rated required competences for graduates working in manufacturing and having a role in innovation in product or service, overall and UK**

All		UK	
1	Performing well under pressure	1	Using time efficiently
2/3	Using computers and the internet; Using time efficiently	2	Coordinating activities
		3	Performing well under pressure
4/5	Working productively with others; Coming up with new ideas or solutions	4/5	Working productively with others; Making meaning clear to others
6	Coordinating activities	6	Coming up with new ideas or solutions
7	Rapidly acquire new knowledge	7	Willingness to question own and others' ideas
8	Making meaning clear to others	8/9	Rapidly acquire new knowledge; Analytical thinking
9	Analytical thinking		
10	Mastery of own field or discipline	10	Using computers and the internet

There were no differences between the top ten competences for graduates overall working in manufacturing (shown in Table 2 above and Table A5 in Appendix C for reference) and the top ten of those having a role in introducing innovations in product or service, as shown here in Table 7. In both sets of top tens, there was a predominance of competences relating to mobilising resources (performing well under pressure, using time efficiently, working productively with others, coordinating activities and making meaning clear to others).

However, within the top ten, those having a role in introducing innovation in product or service were much more likely to rate their ability to come up with new ideas or solutions as highly required (84% compared to 76% overall). They were also much more likely to rate as highly required a number of other competences (outside the top ten): a willingness to question your own and others' ideas, alertness to new opportunities, effective negotiating skills, mobilising the capacity of others and presenting products, ideas or reports (see Table A10 in Appendix C).

Apart from the inclusion of a willingness to question own and others' ideas (and the *exclusion* of mastery of own field) the top ten competences of UK graduates having a role in introducing innovations in product or service were the same as those for the sample overall. However, within these top ten required competences, UK graduates having a role in introducing innovations in product or service were much more likely than UK manufacturing graduates overall to rate highly the following:

- Coming up with new ideas and solutions (83% compared to 68%);
- Rapidly acquire new knowledge (77% compared to 67%);
- Analytical thinking (77% compared to 67%);
- Coordinating activities (88% compared to 77%);
- Making meaning clear to others (85% compared to 76%).

Further, for all the other competences listed (except for ability to write reports, memos or documents) UK graduates having a role in introducing innovations in product or service were much more likely than UK manufacturing graduates overall to rate them highly.

## 6.2 Innovation in technology, tools or instruments

We now turn to manufacturing graduates' role in introducing innovations in technology, tools or instruments. Table 8 below shows the top ten rated required competences (and Table A11 in Appendix C provides the detailed ratings).

**Table 8: Ten most highly rated required competences for graduates working in manufacturing and having a role in innovation in technology, tools or instruments, overall and UK**

All	UK
1 Performing well under pressure	1 Using time efficiently
2 Using computers and the internet	2 Working productively with others
3 Using time efficiently	3/4/5 Performing well under pressure;
4 Coming up with new ideas or solutions	Analytical thinking;
5 Working productively with others	Making meaning clear to others
6/7/8 Analytical thinking;	6 Mastery of own field or discipline
Rapidly acquire new knowledge;	7/8 Using computers and the internet;
Coordinating activities	Rapidly acquire new knowledge
9/10 Making meaning clear to others;	9 Coordinating activities
Mastery of own field or discipline	10 Coming up with new ideas or solutions

Once again, there were no differences between the top ten competences for graduates overall working in manufacturing (shown in Table 2 above and Table A5 in Appendix C for reference) and the top ten of those having a role in introducing innovations in technology, tools or instruments, as shown here in Table 8.

However, within the top ten, those having a role in this aspect of innovation were more likely to rate as highly required:

- Ability to come up with new ideas or solutions (83% compared to 76% overall);
- Analytical thinking (81% compared to 75% overall).

They were also much more likely to rate as highly required two other competences (outside the top ten): a willingness to question your own and others' ideas and mobilising the capacity of others.

The top ten competences of UK graduates having a role in introducing innovations in technology, tools or instruments were the same as those for the sample overall. However, within these top ten required competences, UK graduates having a role in introducing innovation were much more likely than UK manufacturing graduates overall to rate highly the following:

- Analytical thinking (80% compared to 67%);
- Mastery of own field or discipline (79% compared with 68%);
- Rapidly acquire new knowledge (77% compared to 67%).

Further, as with all graduates having a role in innovation, they were also much more likely than UK manufacturing graduates generally to rate as highly required two other competences (outside the top ten): a willingness to question your own and others' ideas and mobilising the capacity of others.

### 6.3 Innovation in knowledge or methods

The third aspect of innovation relates to knowledge and methods.

**Table 9: Ten most highly rated required competences for graduates working in manufacturing and having a role in innovation in knowledge or method, overall and UK**

All	UK
1 Performing well under pressure	1/2/3 Using time efficiently;
2 Using computers and the internet	Coordinating activities;
3 Using time efficiently	Working productively with others
4 Working productively with others	4/5 Performing well under pressure;
5 Coordinating activities	Making meaning clear to others
6/7 Coming up with new ideas or solutions;	6 Analytical thinking
Rapidly acquire new knowledge	7 Using computers and the internet
8/9 Analytical thinking;	8 Coming up with new ideas or solutions
Making meaning clear to others	9/10 Rapidly acquire new knowledge;
10 Mastery of own field or discipline	Mastery of own field or discipline

Once again, there were no differences between the top ten competences for graduates overall working in manufacturing (shown in Table 2 above and Table A12 in Appendix C for reference) and the top ten of those having a role in introducing innovations in knowledge or methods, shown here in Table 9.

However, within the top ten, those having a role in introducing innovations in knowledge or methods were much more likely to rate as highly required:

- Their ability to come up with new ideas or solutions (82% compared to 76% overall);
- Analytical thinking (81% compared to 75% overall);
- Ability to make meaning clear to others (81% compared to 76% overall).



They were also much more likely to rate as highly required a number of other competences (outside the top ten): writing reports, memos or documents, willingness to question your own and others' ideas, mobilising the capacity of others, alertness to new opportunities, presenting products, ideas or reports and asserting authority.

The top ten competences of UK graduates having a role in introducing innovations in knowledge or methods were the same as those for the sample overall. However, within these top ten required competences, UK graduates working in manufacturing and having a role in introducing this aspect of innovation were much more likely than UK manufacturing graduates overall to rate highly the following:

- Coordinating activities (83% compared to 77%);
- Making meaning clear to others (81% compared to 76%);
- Analytical thinking (79% compared to 67%);
- Questioning own or others' ideas (73% compared to 64%);
- Come up with new ideas or solutions (73% compared to 68%);
- Rapidly acquire new knowledge (72% compared to 67%).

Further, they were also much more likely than UK graduates working in manufacturing generally to rate as highly required a number of other competences (outside the top ten): mobilising the capacity of others, asserting authority and knowledge of other fields.

On the basis of this current analysis (albeit limited to just one of the main employment sectors) it would seem that the mix of highly required competences was rather similar for those working in that sector, regardless of whether the individual was involved in introducing an innovation or not. What seems to differ was the particular emphasis given to certain highly required competences, rather than whether they were highly required or not. It also seems that the mix of highly required competences varied to some extent depending on the type of innovation being introduced.

The above basic analysis looked at each aspect of innovation in turn, but further analysis would be required to ascertain to what extent individual graduates purported to have a role in introducing more than one aspect of innovation and whether their mix of highly required competences showed any distinctive patterns.

## 7 Competences acquired during higher education

Having considered the match (or mis-match) between graduates' perceptions of their own competences, some five years after graduation, and the competences required in their employment (if currently employed), we now consider different stages in the graduates' lives where these competences might have been acquired and developed.

We start by looking at the graduates' higher education experiences. There are ongoing debates about how employers' expectations for 'flexible professionals' might impact on higher education curricula, teaching and learning. For example, what should be the appropriate mix between the acquisition of subject-specific knowledge and skills, and more generic competences such as working in teams, problem-solving skills, and the ability to transfer existing knowledge into new contexts and continue to acquire new knowledge? Given the different models of European higher education underpinning national higher education systems (see Report no. 2 in this series), we might expect the answer to be rather different for different countries.

In this section we consider what competences graduates considered they acquired through their higher education programme completed in 1999/2000.

In the previous CHEERS study, graduates had been asked to rate their level of competence at the time of graduation along a number of dimensions (36 in all). Not surprisingly, the vast majority of graduates had rated their learning abilities highly and over two thirds also rated highly their power of concentration, their ability to work independently and their loyalty and integrity (Schomburg and Teichler, 2006). At the same time, less than a third of graduates had rated highly their foreign language proficiency, their skills in computing, leadership, economic reasoning, negotiating and their capability to understand complex social, organisational and technical systems.

As we have noted earlier, in this current REFLEX study, a less elaborate listing of 19 competences were used to characterise a range of skills and capabilities. Further, graduates were asked to identify a maximum of three competences that they regarded as strong points and a maximum of three competences they regarded as weak points in the study programme completed in 1999/2000.

In Tables 10 and 11 below we show the five main strong points and five main weak points identified (Table A8 and Table A9 in Appendix C presents the full listing).

**Table 10: Five main strong points of 1999/2000 study programme, overall and by country (%)**

	All	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Mastery of your own field or discipline	38	26	38	32	35	37	42	36	54	51	52	41
Analytical thinking	37	34	36	29	42	40	41	37	35	35	27	50
Ability to rapidly acquire new knowledge	30	24	25	32	31	37	39	20	28	23	39	33
Ability to write reports, memos or documents	23	22	13	20	26	21	22	20	30	29	25	22
Ability to work productively with others	21	26	17	35	14	16	19	34	19	23	11	12

As we can see from the table, the main strong points of the study programme identified by European graduates overall were:

- Mastery of own field or discipline (38%);
- Analytical thinking (37%);
- Ability to rapidly acquire new knowledge (30%).

Other main strong points were the ability to write reports, memos or documents (23%) and the ability to work productively with others (21%).

However, there were some quite large variations between countries, as shown above. For example, UK graduates were much less likely to rate mastery of own field as a strong point of their study programme (26% compared to 38% overall) and were more likely to state that the ability to work productively with others was a strong point (26% compared to only 21% overall).

In fact, the five main strong points identified by UK graduates were:

- Analytical thinking (34%);
- Ability to perform well under pressure (28% compared to just 19% overall);
- Ability to work productively with others (26%);
- Mastery of own field or discipline (26%);
- Ability to rapidly acquire new knowledge (24%).

Further, the ability to use time efficiently was rated as one of three main strong points by 23% of UK graduates, compared to only 13% overall.

The lower rating by UK graduates of subject mastery per se is noteworthy and may be a result of such subject-specific competence being 'taken –as read' as an inherent outcome of any degree course, whereas the more generic, functional competences were seen as explicit outcomes of the programme. We could also point to developments within UK higher education at the time that our respondents were engaged in higher education – in particular, the emphasis being placed on transferable skills (see, for example, the Quality Assurance Agency for Higher Education, Learning from Subject Review, 1993-2001, p. 20).

Such lower ratings (done in retrospect) may also reflect UK graduates' subsequent realisation that UK employers seem to put less emphasis during the recruitment process on subject knowledge per se and more emphasis on other, more generic skills and personal attributes (see also Report no. 3 in this series). It is also tempting to suggest that these 'additional' strong points of UK study programmes (performing under pressure, using time efficiently) may be a by-product of the much shorter duration of such study programmes compared with continental Europe, with UK honours degrees being completed in three years of full-time study (or four years in Scotland), and UK graduates being expected to complete 'on time', whereas in continental Europe, programmes tend to be longer and graduates are more likely to take longer than the minimum required period of study to complete (see Report no. 2 in this series).

In Table 11 below we show the five main weak points identified by graduates.

**Table 11: Five main weak points of 1999/2000 study programme, overall and by country (%)**

	All	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Ability to write and speak in a foreign language	40	51	44	62	50	41	37	28	30	34	56	13

Ability to assert your authority	27	32	19	20	32	28	27	32	36	27	28	15
Ability to negotiate effectively	25	26	15	27	29	26	25	30	30	27	19	21
Ability to present products, ideas or reports to an audience	22	28	18	26	21	23	26	22	23	28	27	8
Ability to use computers and the internet	18	15	20	31	20	19	20	17	14	27	16	4

The overwhelming weak point identified by graduates overall was the ability to write and speak in a foreign language – in this respect, it would seem that not much has changed since the earlier study of European graduates. Forty per cent of all graduates identified this as a weak point and this proportion rose to over half of graduates from the UK, France, the Czech Republic and Spain (where the figure was 62%). Other weak points identified overall were the ability to assert authority, the ability to negotiate effectively, the ability to present products, ideas or reports to an audience and the ability to use computers and the internet.

Once again, there was some variation in the main weak points identified, but there was rather more similarity between the main weak points identified overall and those identified by UK graduates than we found in the main strong points listings.

The five main weak points identified by UK graduates were the ability to:

- Write and speak in a foreign language (51%);
- Assert authority (32%);
- Present products, ideas or reports to an audience (28%);
- Negotiate effectively (26%);
- Mobilise the capacity of others (20%).

In the above, we have shown variation in strong and weak points in study programmes by country but there are also likely to be variations by field of study (see Report no. 3 in this series). Also, the above snapshot of the five main strong and weak points cannot tell the whole story. For example, in Table 11 above, we see that around one fifth (18%) of all graduates considered the ability to use computers and the internet was a weak point of their programme; however, the same proportion (18%) considered that to be a strong point of their programme.

It is also interesting to note that almost a quarter of all graduates (23%) listed the ability *to write* reports, memos or documents as a strong point of their programme and the same proportion (22%) listed the ability *to present* products, ideas or reports *to an audience* as a weak point.

## 8 Development of competences through a range of experiences prior to and during higher education

Though individuals will develop and acquire competences through their higher education studies, other experiences prior to and during higher education are also likely to provide opportunities for developing certain competences. Moreover, in addition to higher education per se, it is likely that students will have been undertaking a variety of other activities through which employment-related competences (particularly some of the more generic ones) may have been developed.

In this section we look at the pattern of graduates' work-related and other experiences prior to and during higher education.

Our previous study of European graduates (the CHEERS study) found that almost a third had been involved in some form of employment *prior* to starting their higher education, though the proportion in the UK (16%) was much lower (Schomburg and Teichler, 2006).

Moreover, in terms of other activities undertaken during higher education, a significant minority (46%) of all graduates in the CHEERS study had been engaged in employment not related to their study and in the case of the UK the proportion was much higher (65%); a third had undertaken employment/work related to their studies but with the UK having a lower proportion (23%) and just under a third had done a work placement/internship during higher education, though once again the UK proportion that had done so was slightly lower (25%).

In this REFLEX study we once again sought information about the extent of the graduates' experiences of work prior to and during higher education (see Table 12 below).

**Table 12: Work experience before and during higher education, overall and by country (%; multiple responses)**

	All	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Study-related work experience before higher education	27	19	9	7	15	34	46	21	31	32	27	51
Non-study-related work experience before higher education	55	48	31	25	50	66	54	79	73	67	63	49
Study-related work experience during higher education	49	21	22	23	61	71	62	46	70	59	48	49
Non-study-related work experience during higher education	53	45	36	34	58	65	51	73	56	52	66	50
No work experience	18	33	43	46	11	7	9	8	6	10	10	11
Placement/internship	55	29	21	56	72	45	80	86	79	59	36	43

Prior to higher education, a quarter of all graduates had undertaken some study-related work experience and over half had non-study-related work experience. However, these overall proportions mask some large differences: respondents from Germany and Switzerland were much more likely to have undertaken some study-related work experience prior to higher education (46% and 51% respectively) and those from Italy and Spain much less likely to have done so (less than 10% in each country). UK graduates were below the overall average for both study-related and non-study-related experiences prior to higher education (19% and 48% respectively).

During higher education, similar proportions of graduates overall indicated they had study-related and non-study-related work experience (49% and 53% respectively). But once again we see some rather large differences between countries. Over 60% of graduates in France, Austria, Germany and Finland had study-related work experiences during higher education, compared to around 20% of graduates from the UK, Italy and Spain. Sixty per cent (or more) of graduates from Austria, the Netherlands and the Czech Republic had non-study-related work experience during higher education, but only a third of Italian and Spanish graduates did so.

Only a fifth of UK graduates gained study-related work experiences during higher education (compared to half the overall sample) and just under half gained non-study-related work experience (compared to just over half the overall sample).

But arguably the most striking difference between countries was in the incidence of placements/internships as part of the higher education programme. Over half of all the graduates in the sample had done a placement, but in Germany, the Netherlands and Finland the vast majority of graduates (80% or more) had done so. In the UK, less than a third had done a placement (similar to the proportion from the Czech Republic) and only Italy had a lower proportion (21%). Compared with the earlier European (CHEERS) study we see that the overall proportion doing a placement/internship had increased significantly (from 30% to 55%), whereas for the UK, the proportion had only increased from 25% to 29%.

We should also note that less than a fifth of all the graduates had no work experience (prior to or during higher education), not taking account of placements. However, a third of UK graduates had no such work experiences and only Italy and Spain had higher proportions in this category (43% and 46% respectively).

Even when we consider those UK graduates who had undertaken a placement/internship, we still find that a fifth of the UK graduates (22%) had neither undertaken a placement nor had other work experiences.

This low level of work experiences during higher education for UK graduates (in comparison to most of their European counterparts) is particularly noteworthy. The importance of work experience for all undergraduates has been stressed in the findings of contemporary national enquiries (for example, the Dearing Report) and several UK government statements have commended work experience during higher education as a way of enhancing students' subsequent employability. Further, some studies have shown that benefits can accrue from such experiences relating to transition to work and aspects of 'work-readiness' more generally (see, for example, Bowes and Harvey, 1999; Blasko, Little and Woodley, 2002; Mason, Williams, Cranmer and Guile, 2003; Brennan and Shah, 2003).

Further detailed analysis of these various work-related activities and the relationship (if any) to graduates' ratings of their higher education programmes, to transitions into initial employment after graduation and to the alignment of skills and knowledge required in graduates' first employment would be needed to explore to what extent and in what ways graduates in this REFLEX study accrued any additional benefits from undertaking such activities.

# 9 Other study programmes, in addition to programme completed in 1999/2000

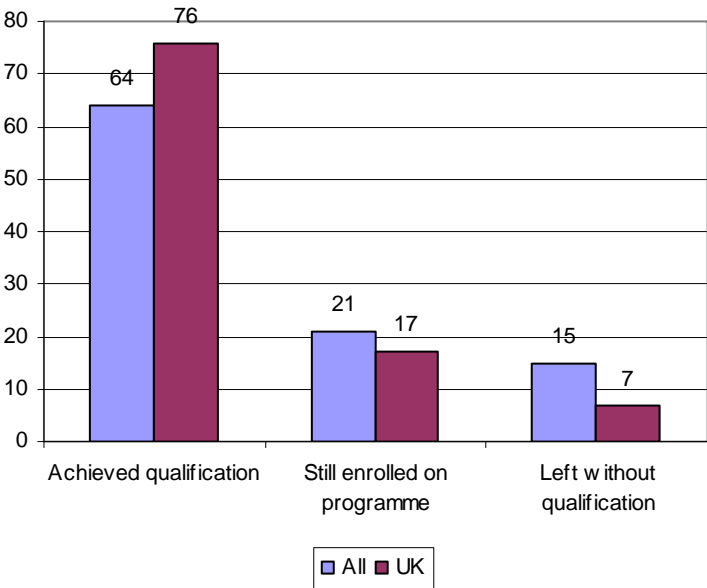
In considering the development of competences of European graduates, we need to acknowledge that labour market sectors and national traditions differ in the division of responsibilities between higher education, subsequent professional education and continuing workplace training.

In an attempt to gain as full a picture as possible of graduates' experiences of work and study, respondents were asked if they had enrolled on any other studies/training programmes (of at least one year's duration) in addition to the degree programme from which they had graduated in 1999/2000. A large minority of all respondents had taken up other studies (just over 40%), although more than half (58%) indicated they had not done so. The proportion of UK graduates who had done so was also 40%. Furthermore, just over one in ten of the overall sample had enrolled on more than one additional programme.

In the analysis that follows we focus on the outcomes of one of these additional programmes.

The outcome of taking up an additional study or training programme (of at least one year's duration) is shown in Figure 8 below.

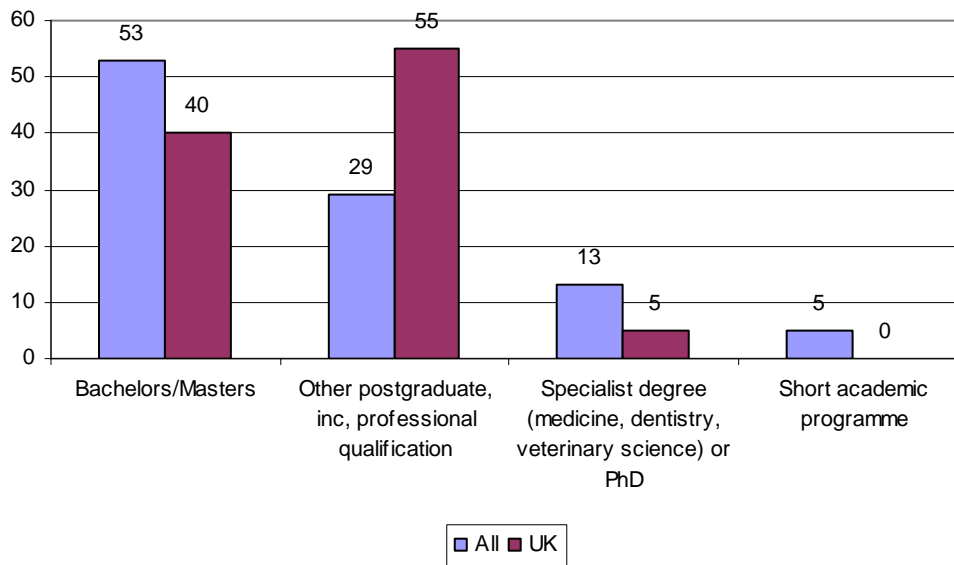
**Figure 8: Outcomes of additional study, overall and UK (%)**



Almost two thirds of all those who had undertaken additional studies had now successfully completed their studies and UK graduates were much more likely to have done so (just over three quarters).

For those indicating they had undertaken additional study, the type of additional study successfully completed is shown overleaf.

**Figure 9: Type of additional qualification gained, overall and UK (%)**



The overall picture shows that the additional qualification most likely to have been gained was a bachelors/masters (53%), followed by other postgraduate qualifications including professional qualifications followed in combination with work (29%) and specialist degrees (identified separately in some countries) and PhDs (13%).

As we can see, UK graduates were less likely to have completed a bachelors/masters in addition to the academic programme completed in 1999/2000 and much more likely to have completed another postgraduate qualification or professional qualification (55% compared to 29% overall).

This finding is likely to reflect the fact that, with the exception of a few subject areas (particularly education and health-related areas) generally in the UK, the first (bachelors) degree does not, of itself, confer professional status and graduates seeking to enter certain professions are likely to need to undertake specific professional training (often undertaken whilst working) in addition to their first degree. This finding also contradicts somewhat previous suggestions that holders of UK bachelors degrees might need to ‘top up’ with masters qualifications in order to compete in an increasingly international labour market (Brennan, 2005). However, as higher education programmes in continental Europe become more aligned to a common bachelors/masters structure (as part of the Bologna agreement), we may see the pattern of take-up of other additional studies changing.

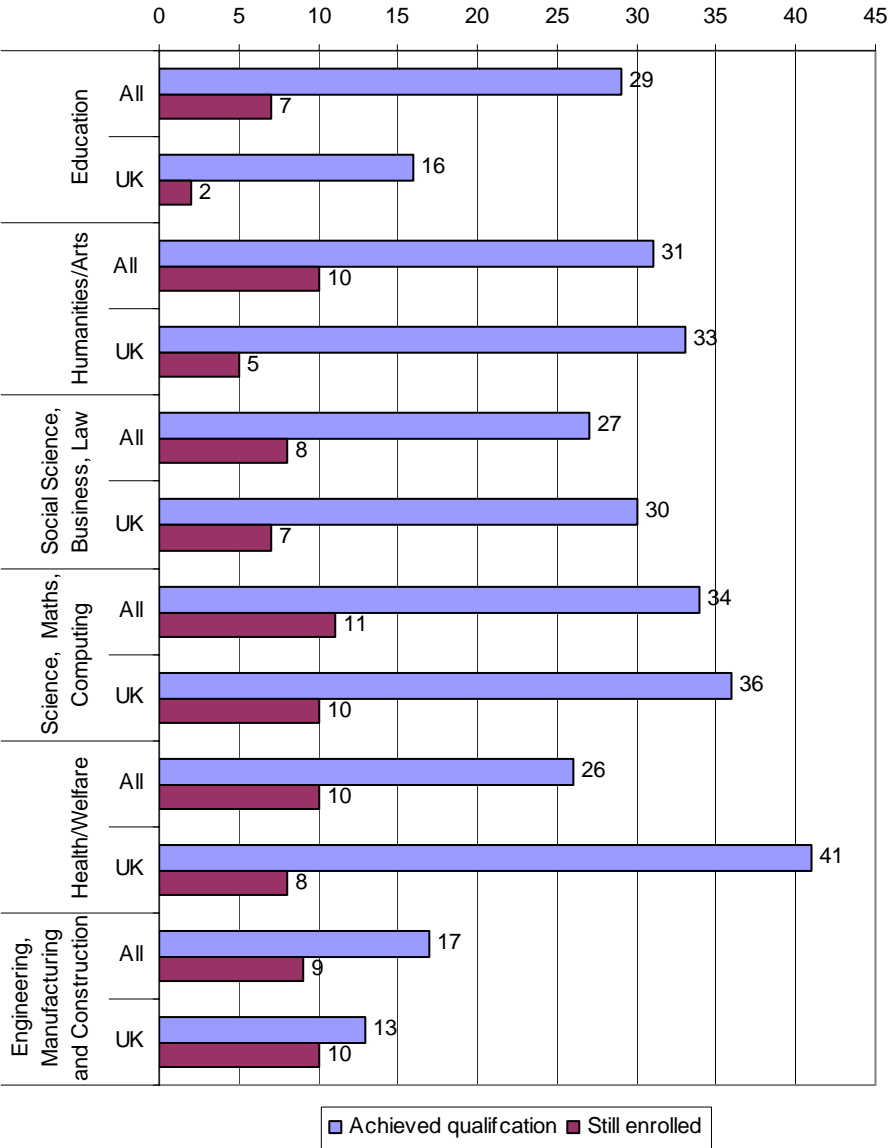
We should also note that the previous CHEERS study found that over a quarter of European graduates (29%) had undertaken further professional education and training after graduating in 1995 and a quarter of UK graduates had done so (Schomburg and Teichler, 2006). But given the different formulation of questions in relation to further education and training used in the REFLEX study, it is not possible to make direct comparisons between the two studies.



### 9.1 Which graduates are more likely to undertake additional study?

In Figure 10 below, we consider the incidence of additional study by the broad field of higher education programme completed in 1999/2000.

**Figure 10: Graduates undertaking additional study by broad field of higher education completed in 1999/2000, overall and UK (%)**



Note: Agriculture and veterinary science, services not shown – low numbers for UK

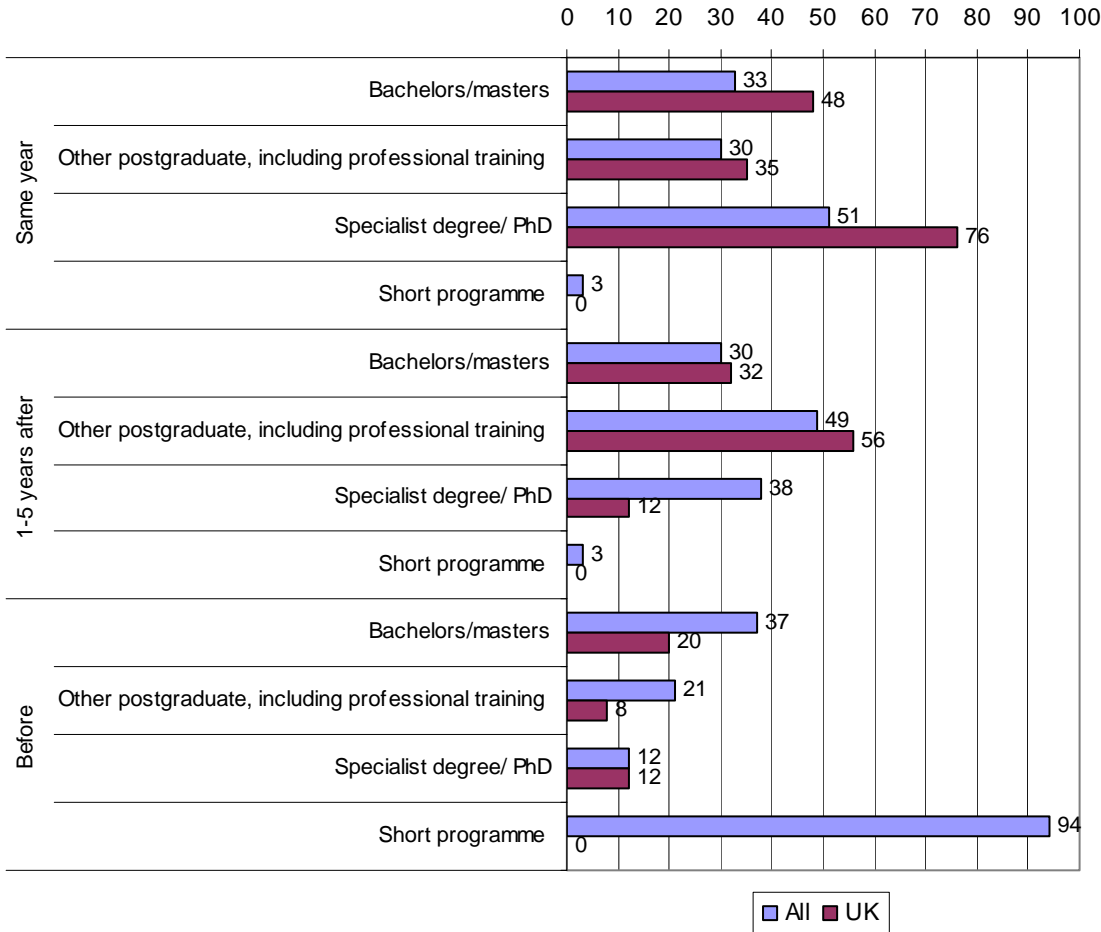
As we can see, the pattern of enrolment in additional programmes for the overall sample shows that graduates who had completed a programme in science, maths and computing in 1999/2000 were the most likely to have achieved an additional qualification (or still be enrolled on an additional programme of study), closely followed by graduates who studied arts/humanities. Graduates who completed an engineering, manufacturing or construction programme in 1999/2000 were least likely to have achieved an additional qualification (or still be enrolled).

The pattern for UK graduates varied slightly from this overall picture. In the UK it was health and welfare graduates who were most likely to have achieved an additional qualification (or still be enrolled) – 41% compared to only 26% of graduates overall – followed by graduates in science, maths and computing. UK education graduates were much less likely than graduates overall to have achieved an additional qualification (16% compared to 29% overall) and (in line with the picture overall) UK graduates in engineering, manufacturing or construction were the least likely to have achieved an additional qualification.

### 9.2 Timing of additional studies

In addition to knowing whether our respondents have successfully any additional studies, we also know something about when they acquired these additional qualifications. In Figure 11 below we indicate when our graduates started these additional studies: the same year as completing their ‘main’ programme (from which they graduated in 1999/2000), one to five years after completing their main programme or before completing their programme.

**Figure 11: Timing of starting additional studies in relation to main programme completed in 1999/2000, overall and UK (%)**



As we see from the above figure, of those who had acquired academic or professional qualifications in addition to the programme completed in 1999/2000, a significant minority had already acquired these qualifications before completing their degree programme in 1999/2000.

In the case of additional bachelors/masters, UK graduates seemed much more likely than graduates overall to be embarking on these programmes in the same year as completing their main programme (48% compared to 33% overall), and less likely to have already completed such a programme prior to completing their main programme in 1999/2000.

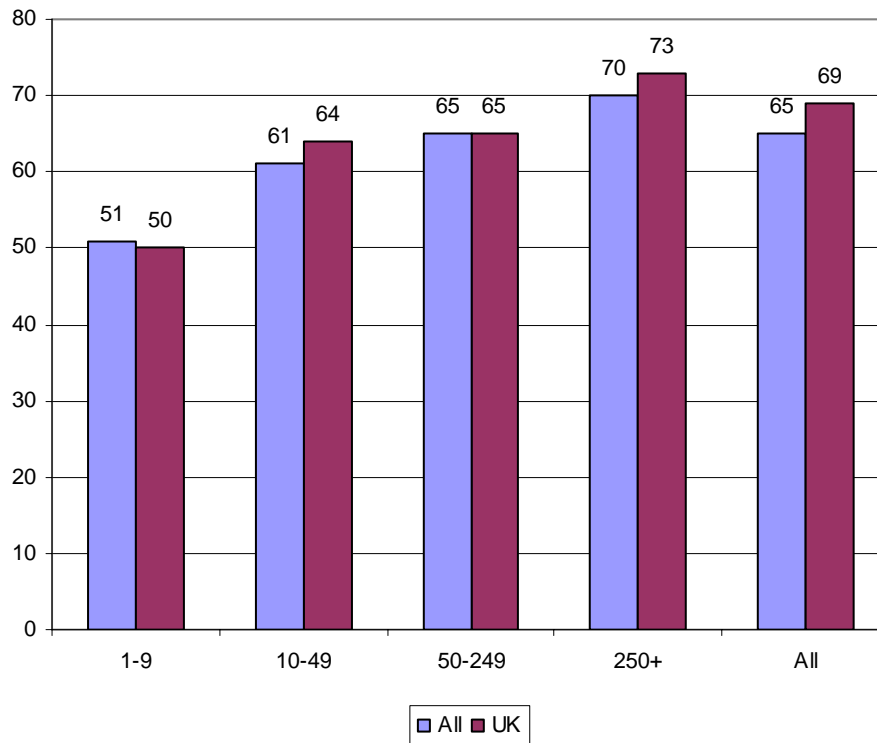
UK graduates were similar to graduates overall in the extent to which they enrolled on other postgraduate and professional programmes in the year in which they completed their main study programme. But they were less likely to have embarked on such programmes before completing their main study programme and more likely than all graduates to start on other postgraduate and professional study programmes one to five years after completing their main programme (56% compared to 49% overall).

Although some of these other studies undertaken by graduates may have been undertaken primarily for work-related purposes – in particular those programmes leading to professional qualifications – others may well have been followed for more personal reasons. Nevertheless, regardless of the nature of the additional study, it is likely that the graduates' skills and knowledge base will have been changed as a result of undertaking these other studies in ways that may be helpful to the individual in undertaking current work tasks. Further detailed analysis would be required to investigate the relationship, if any, between graduates' propensity to undertake additional studies and their perceptions of current levels of competences.

### **9.3 Work-related training**

In addition to these other studies, we also know that many respondents had recently engaged in work-related training. Almost two thirds of all graduates (65%) had followed a work-related course/training in the previous 12 months and 69% of UK graduates had done so. Figure 12 below shows the incidence of such training by size of organisation, for the sample overall and for the UK.

**Figure 12: Incidence of work-related training in past 12 months by size of organisation, overall and UK (%)**



The UK pattern of engagement in work-related training by size of organisation was very similar to the overall sample. As anticipated, those graduates working in micro-businesses (one to nine employees) were less likely to have undertaken any work-related training in the past 12 months than graduates working in larger organisations but, nevertheless, half had done so. Such a finding can be seen in a positive light, given the continuing concerns about the propensity of small businesses in the UK to invest in employee training (see, for example, SSDA, 2006).

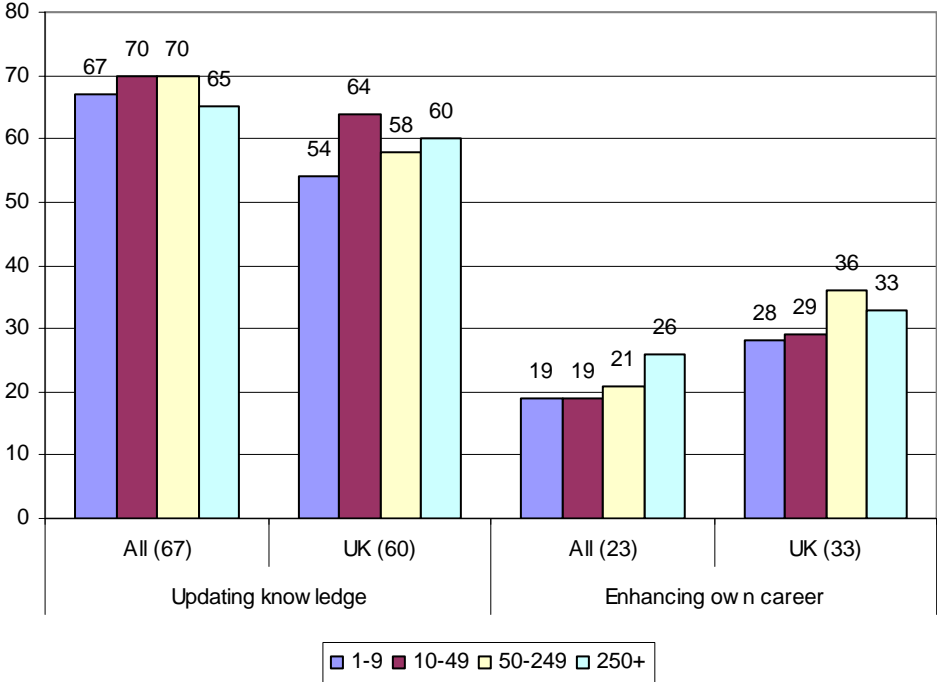
The most important reason that graduates overall had undertaken these work-related training courses was updating knowledge for current work (68%). The other important reason was enhancing own career (23%). Preparing for working in another field was cited by only 4% and preparing for self-employment by just 1% of all graduates.

UK graduates were slightly less likely to cite updating knowledge (60%) and more likely to cite enhancing own career (33%) as the main important reasons for undertaking work-related training.

Direct comparisons with the earlier CHEERS study (of 1994/95 graduates, three to four years after graduation) are not possible, given the slightly different ways that questions were posed about further education and training in the earlier study. However, it is interesting to note that in the CHEERS study of graduates three years after graduation, UK graduates were much more likely to cite enhancing own career (54% compared to 32% European aggregate) and much less likely to cite updating knowledge (49% compared to 63% European aggregate) as the most important reason for further education and training. It may be that in the REFLEX study of graduates five years after graduation, the UK graduates were in employment situations which they considered constituted a career path and hence were more likely to seek to extend their knowledge base relevant to their current work, whereas in the previous study the UK graduates, three years after graduation, were still making transitions to what they considered to be a career pathway and hence were more likely to be undertaking further education and training as a way of enhancing their own career.

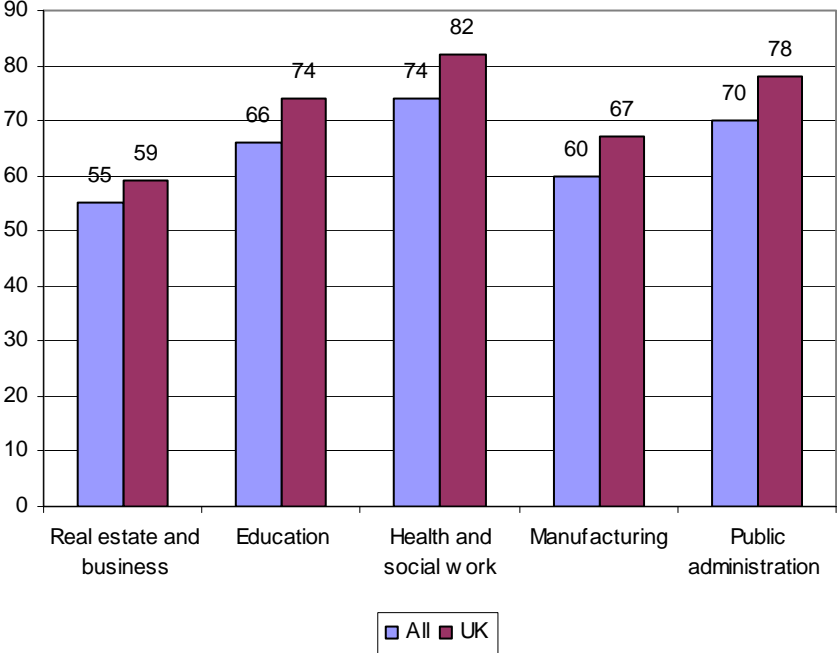
As we see from Figure 13 below, graduates' reasons for undertaking work-related training in the past 12 months varied only slightly by size of organisation.

**Figure 13: Reasons for undertaking work-related training by size of organisation, overall and UK (%)**



Turning to the incidence of work-related training by sector of employment, we see some variation. Figure 14 below presents the detail.

**Figure 14: Incidence of work-related training in past 12 months by main sector of employment, overall and UK (%)**

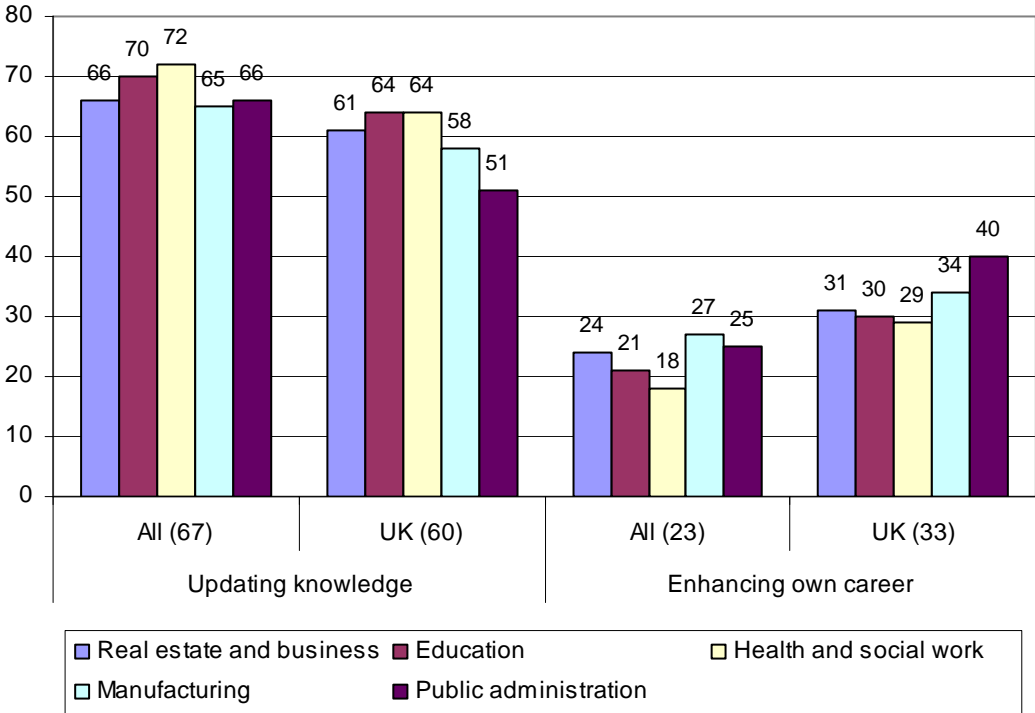


Graduates working in either health and social work or in public administration were the most likely to have undertaken a work-related training course in the past 12 months. Those working in business were the least likely, though over half had done so.

In each of the main sectors of employment, UK graduates were more likely to have done such training than graduates overall and this was particularly the case for those working in education, health and social work and public administration (eight percentage points difference in each case).

Not only did the incidence of work-related training vary, but graduates' reasons for undertaking training in the past 12 months also varied by sector of employment (Figure 15 below).

**Figure 15: Reasons for undertaking work-related training in past 12 months by main sector of employment, overall and UK (%)**



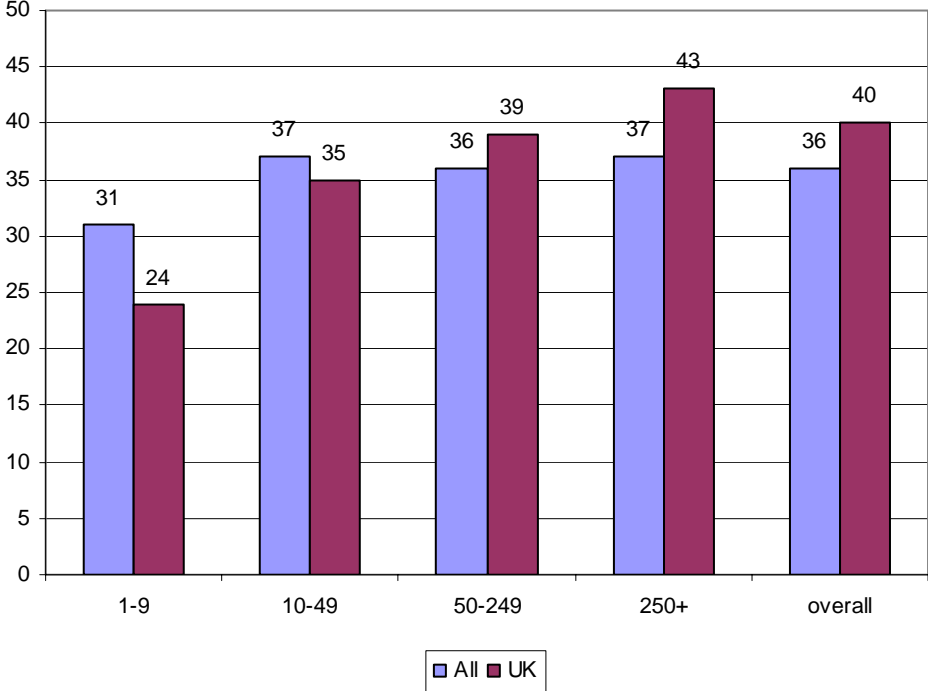
Taking graduates overall, there was little variation between the five main sectors of employment in graduates’ reasons for undertaking work-related training. However, those working in health and social work were slightly more likely to cite updating knowledge and slightly less likely to cite enhancing own career as the most important reason. This emphasis on updating knowledge fits with the earlier finding that graduates working in health and social work were slightly more likely than graduates overall to rate mastery of own field as a highly required competence.

However, when we look at UK graduates, we see that it is those working in public administration whose reasons for undertaking work-related training were at variance with those working in the other main sectors of employment. Those working in public administration were less likely to cite updating knowledge and more likely to cite ‘enhancing own career as the most important reason for doing the work-related training. This seems to fit with our earlier finding that UK graduates working in public administration were less likely than graduates overall to rate mastery of own field as a highly required competence (although we should also recall that this lower rating of mastery of own field by UK graduates was prevalent across all the main sectors of employment).

**9.4 Education/training related to professional development**

Finally, we can consider the extent to which respondents had been recently engaged in education or other training related to their professional development (i.e. in the preceding four weeks). We first look at the pattern by size of organisation and then by main sector of employment.

**Figure 16: Incidence of education/training related to professional development in past four weeks by size of organisation, overall and UK (%)**

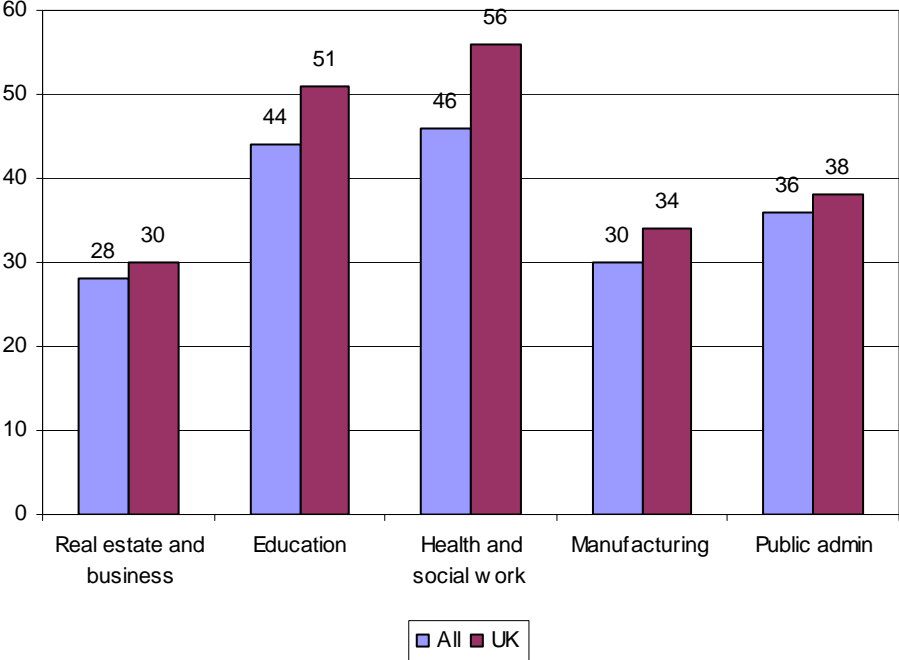


As we can see, just over a third of all graduates had undertaken some education or training relating to their professional development in the past four weeks and there was little variation by size of organisation. Slightly more UK graduates had been involved in such professional development (40% compared to 36% overall), but those working in micro-businesses were much less likely to have done so (just 24% compared to 40% of all UK graduates).

Figure 17 below shows the incidence of professional development in the past four weeks, by main sector of employment.



**Figure 17: Incidence of education/training related to professional development in past four weeks by main sector of employment, overall and UK (%)**



Overall, we see that graduates working in the education sector and in health and social work were much more likely than graduates working in the other main sectors of employment to have engaged in education or training related to their professional development in the past four weeks.

This pattern was repeated for UK graduates, but with even larger differences between sectors. Thus, over half of the UK graduates working in education or in health and social work had recently undertaken professional education/training compared to about a third of those working in real estate and business and in manufacturing.

Further detailed analysis would be required to investigate the relationship, if any, between graduates' propensity to undertake work-related training and education/training related to professional development and the extent of a match or mis-match in competences required in their current work.

## 10 Summary and conclusions

In this report we have concentrated on graduates' engagement with the labour market in relation to aspects of productivity, including levels of skills and innovation, and aspects of initial education and further work-related training.

First, we have presented an analysis, in mainly broad aggregate terms, of what competences graduates perceived were required in their current work, whether and how these requirements varied by employment sector and type of organisation and the extent to which graduates' own competences matched their current work requirements.

We have then briefly examined the level of innovation in graduates' organisations, the extent to which graduates had a role in introducing innovations and whether there was anything distinctive about such graduates' competences.

Finally, we have looked at the range and nature of graduates' experiences of work prior to and during higher education and their experiences of other education and training programmes and work-related training – all of which were likely to have informed the development of graduates' current competences, in addition to the higher education programme completed in 1999/2000.

Where possible, we have made comparisons with the previous European survey of graduates (the CHEERS study) although the slightly different formulation of certain questions and new questions has meant such comparisons have been limited.

### ***Findings in relation to graduates' competences required for current employment***

From the analysis of graduates' perceptions of which competences were highly required in their current jobs, we have found that the majority (over three quarters) needed to be subject specialists who were flexible and adaptable (in terms of acquiring new knowledge) and were capable of working on their own and with others (in terms of using time efficiently, working well under pressure, working productively with others, coordinating activities and were capable of making their meaning clear to others). Such findings lend some weight to the rhetoric of 'flexible professionals' though we note there was less of a requirement to be able to assert authority and to be a generalist (in terms of having knowledge of other fields).

In comparison with graduates overall, it seems that UK graduates' job requirements tended to emphasise aspects of mobilisation of resources (using time efficiently, working productively with others, making meaning clear to others) more than professional expertise and functional flexibility (in terms of subject knowledge per se in their own and other fields and the acquisition of new knowledge). This finding fits with the fact that UK graduates were also less likely to indicate that their own or a related field was the most appropriate for their current work.

The set of highly required competences varied to some extent by main employment sector, although in each sector the overall pattern was broadly similar. However, in each of the main employment sectors, we see the same pattern of UK graduates' jobs seeming to put more emphasis on aspects of mobilisation of resources and slightly less emphasis on professional expertise and functional flexibility.

We also find some variation in the set of highly required competences between the private and the public sector, with the work requirements of graduates working in the latter sector putting less emphasis on innovation and knowledge management (in terms of alertness to new opportunities and use of computers and the internet) and functional flexibility (in terms of effective negotiating skills). Compared to all graduates working in the private sector, UK

private sector graduates reported lower requirements in a number of areas. Further, it seems that public sector job requirements in the UK particularly emphasised aspects of mobilisation of resources (in terms of using time efficiently and working productively with others) and also asserting authority. This latter finding was not surprising given the finding that graduates working in education in particular – a primarily public sector environment – (and in health and social work, as far as UK graduates were concerned) rated the requirement to assert authority higher than graduates working in any of the other main sectors of employment.

The limited analysis undertaken of competence requirements by size of organisation (in particular, small organisations of 10-49 employees and micro-businesses) found little variation between these organisations and the overall sample. However, UK graduates working in micro-businesses and small organisations were more likely to indicate a particular emphasis (yet again) on mobilisation of resources.

We should also note that (with the exception of graduates working in manufacturing) less than half of all graduates rated foreign language competence as highly required in their current jobs and less than one in ten UK graduates did so. So despite the continuing concerns expressed by UK employers about the lack of foreign language competence among employees, our survey findings seem to suggest that UK graduates did not perceive such competence as being particularly required in their current jobs.

A concern with graduates' current job requirements tells us something about the demands of their employment in terms of competences – but we also need to consider the extent of matches and mis-matches between such requirements and the extent to which graduates considered they actually possessed such competences.

The proportion of graduates overall perceiving surpluses was quite large. The main surpluses, identified by almost a third of all graduates, were in their capacity to perform well under pressure and their foreign language competence (31% and 29% respectively). Further, we found that around a fifth of all graduates perceived they had a surplus of competences relating to aspects of innovation and knowledge management, functional flexibility and communication capabilities. Somewhat surprisingly, there was no difference between the top ten lists of surpluses for graduates overall, graduates in the UK and graduates in France. The list for Germany was also very similar.

A much smaller proportion of graduates overall perceived deficits. The biggest deficit for graduates overall was in using time efficiently (affecting 15% of all graduates) and only 9% of all graduates perceived a deficit in being alert to new opportunities. But as with surpluses, there was little difference in the list of top ten deficits between the overall sample and the UK, France and Germany samples. Though graduates perceiving deficits represented only a minority of the graduates overall, certain aspects of professional expertise (in the shape of asserting authority and mastery of own discipline) were among these competence deficits.

Thus, regardless of their educational pathways to their current employment (be it primarily a bachelors or a masters degree), it seems that graduates experienced very similar surpluses and deficits in the knowledge and skills they brought to their jobs.

### ***Findings in relation to innovation***

Skill level is just one dimension of productivity – level of innovation is another. Overall, half the graduates considered there were high levels of innovation within their organisations in relation to knowledge or method (51%) and in relation to product or service (47%), but slightly less (41%) rated high levels of innovation in technology, tools or instruments. UK graduates were much more likely than graduates overall to rate high levels of innovation for each of these aspects.

Levels of innovation varied by sector of employment, with graduates working in manufacturing most likely to rate high levels of innovation in relation to product or service (62%) and technology, tools or instruments (55%). Graduates working in education or in business were most likely to rate high levels of innovation in relation to knowledge or methods (59% and 57% respectively). In all of the main sectors of employment and along all three aspects (with the exception of manufacturing, product or service), UK graduates were more likely than others to indicate high levels of innovation.

Overall, graduates' own roles in introducing innovation varied: 61% indicated they played a role in introducing innovation in knowledge or methods, but only 47% indicated such a role in relation to product or service and 35% in relation to technology, tools or instruments. Levels of graduates' involvement also varied by main sector of employment. Seventy-two per cent of graduates working in education indicated they played a role in introducing innovations in knowledge or method (compared to just 54% of those working in public administration); half of those working in business or in manufacturing played a role in introducing innovations in product or service (compared to just 38% of those working in public administration) and about four in ten of those working in business or in manufacturing played a role in introducing innovations in technology, tools or instruments (compared to less than 30% of those working in health and social work, or in public administration). Comparing UK graduates' roles with graduates overall, we find no overall pattern emerging but within health and social work, it seems that UK graduates were less likely to play a role in introducing innovations, whereas in public administration they were more likely to play a role in respect of product or service and knowledge and methods, but less likely in relation to technology, tools or instruments.

Investigation of whether there is anything distinctive about the competences required of graduates playing a role in introducing innovation was undertaken by looking at just one employment sector, manufacturing. Overall, for each aspect of innovation, we found no difference in the top ten highly required competences between those playing a role in introducing innovations and all graduates working in manufacturing. However, in each aspect of innovation, for those playing a role, the ability to come up with new ideas or solutions was particularly highly rated; in addition, analytical thinking was particularly highly rated by those playing a role in relation to innovations in product or service and in technology, tools or instruments.

For UK graduates having a role in each aspect of innovation, their top ten list of highly required competences was very similar to all graduates playing such a role. However, when we compare UK graduates playing a role in innovation and all UK graduates employed in manufacturing, we see that in general the former group were more likely to rate a range of competences as highly required.

### ***Findings in relation to knowledge and skills acquired through higher education and other activities***

When we considered what were the strong points (in relation to competences) that graduates thought they had developed during their higher education programmes we found that, overall, graduates considered mastery of own field, analytical thinking and ability to rapidly acquire new knowledge were the main strong points. However, UK graduates were much less likely to identify mastery of own field as one of the main strong points, but were more likely to rate performing well under pressure and working productively with others. The lower rating of subject mastery per se is noteworthy and may be a result of such subject-specific competence being taken –as read as an inherent outcome of any degree course, whereas the more generic, functional competences have been identified as explicit outcomes.

Though graduates will have acquired and developed competences through their higher education studies completed in 1999/2000, other experiences prior to and during higher education, as well as more recent experiences of work and of work-related education and

training, may have provided opportunities for developing competences further. Overall, about half of all graduates had gained non-study-related work experience prior to and during higher education: UK graduates were slightly less likely to have done. Similarly, just under half of all graduates had gained study-related work experience during higher education, but UK graduates were much less likely to have done so (21%). There were also large variations in the proportion of graduates who had done placements/internships as part of their programme: overall half of all graduates had done so, but in some countries (Germany, the Netherlands, Finland) the vast majority had done so, whereas less than a third of UK graduates had done so. Taken together, we find that UK graduates had much lower levels of work experience during higher education than most of their European counterparts.

However, we found that similar proportions of UK graduates and graduates overall (just over 40%) had enrolled on other studies/training programmes in addition to the one completed in 1999/2000. In comparison with graduates overall, UK graduates were much more likely to have completed a postgraduate/professional qualification and slightly less likely to have completed an additional bachelors or masters programme.

Almost two thirds of graduates overall had also taken part in work-related training in the past 12 months and 69% of UK graduates had done so. As anticipated, graduates working in micro-businesses were slightly less likely to have done so, but nevertheless half had done so and this was the case for UK graduates as well. There was some variation in the incidence of work-related training between the main sectors of employment, with graduates working in health and social work the most likely to have done so and those working in business the least likely. But in each of the main sectors of employment, UK graduates were more likely to have been involved in such training and this was particularly the case in education, health and social work and public administration.

Just over a third of all graduates had undertaken some education or training related to their professional development in the past four weeks. Once again, it was graduates working in health and social work and in education who were much more likely to have done so (and those working in business the least likely to have done so). Slightly more UK graduates had been engaged in such activities (40%) and the variation between sectors of employment was even more pronounced: 56% of those working in health and social work and 51% of those working in education had undertaken such professional development activities in the past four weeks compared to only 30% of those working in business.

### ***Further avenues for investigation***

The study has raised a number of questions that would benefit from further investigation and examination. The following lists those issues that specifically relate to areas covered in this report.

Though we have reported general findings in relation to the competences needed in graduates' current work and have found some variations between sectors of employment and type of organisation, further exploration is required to explore whether and to what extent certain aspects of graduates' jobs (for example, the level and nature of their work) are related to certain skill sets.

Further, our broad-brush analysis of skills surpluses and deficits found, perhaps rather surprisingly, very little variation between graduates overall and UK graduates (and those in France and Germany). Further analysis is needed to take into account many aspects of graduates' work (including the sector of employment and size of organisation) and graduates' propensity to undertake work-related training and education/training related to professional development, to ascertain whether there are any particular patterns to the mis-matches found.

We found that the incidence of graduates' role in introducing innovations varied both by sector of employment and the particular aspect of innovation. But further analysis is needed to ascertain whether certain types of graduates are more or less likely to play such a role. Also, we need to explore what aspects of graduates' current employment might be conducive to them having such a role and examine to what extent graduates' overall values and orientations to work are related to the likelihood of them having a role in innovation.

In general, we found that UK graduates have much lower levels of work experience during higher education than most of their European counterparts. But further analysis is needed to explore the relationship, if any, of the pattern of work experience to graduates' ratings of their higher education to the transition to initial employment after graduation and to the alignment of skills and knowledge required in their first employment after graduation.

### **Conclusions**

This report has focused primarily on graduates' own perceptions of the competences required in their current employment. We have found that, in terms of their current employment, the majority of graduates (over three quarters) did need to be subject specialists who were flexible and adaptable and were capable of working on their own and with others. Such findings lend some weight to the rhetoric of 'flexible professionals', though we note there was less of a requirement to be able to assert authority and to be a generalist. In comparison to graduates overall, UK graduates' job requirements tended to emphasise aspects of mobilisation of resources slightly more than professional expertise and functional flexibility. Such findings seem to fit with the looser link between higher education and graduate employment found in the UK (and noted elsewhere in this series of reports).

Notwithstanding this looser link, UK graduates did not seem to experience any more (or less) or any different competence surpluses and deficits than graduates in continental Europe (where the higher education systems were often much more closely aligned to specific occupational pathways).

Further, we note that UK graduates were less likely than graduates overall to gain experiences of work during their period of higher education and were more likely to supplement their higher education studies with additional postgraduate/professional training. However, once in employment (some five years after graduation), though there was some indication of differences in the take-up of work-related training and activities related to professional development between UK graduates and graduates overall, much bigger differences related to the sector of employment (and to a more limited extent, the size of employer).

## References

- Allen, J. and van der Velden, R. (eds) (forthcoming) *The flexible professional in the knowledge society: general results of the REFLEX project*. The Netherlands: Maastricht University
- Arthur, L., Brennan, J., Hick, R., and Kimura, M. (forthcoming) *The context of higher education and employment: comparisons between different European countries*. REFLEX Report to HEFCE No 2.
- Blasko, Z., Little, B. and Woodley, A. (2002) *UK graduates and the impact of work experience*. Bristol: Higher Education Funding Council for England.  
[www.hefce.ac.uk/pubs/rdreports/2002/rd17\\_02/](http://www.hefce.ac.uk/pubs/rdreports/2002/rd17_02/)
- Bowes, L. and Harvey, L. (1999) *The impact of sandwich education on the activities of graduates six months after graduation*. Birmingham: University of Central England in Birmingham.
- Brennan, J. (2005) 'Things we know and don't know about graduate employment'. *Higher Education Digest*, Issue 53, Autumn, London: Centre for Higher Education Research and Information.
- Brennan, J., Johnston, B., Little, B., Shah, T. and Woodley, A. (2001) *The employment of UK graduates; comparisons with Europe and Japan*. Bristol: Higher Education Funding Council for England, 01/38.
- Brennan, J. and Shah, T. (2003) *Access to what? Converting educational opportunity into employment opportunity*. London: Centre for Higher Education Research and Information, the Open University.
- Brennan J. and Tang W. (forthcoming) *The employment of UK graduates: comparisons with Europe*. REFLEX Report to HEFCE No 1.
- Brennan, J. and Tang, W. (forthcoming) *Subject differences in graduate employment across Europe*. REFLEX Report to HEFCE No 3.
- Department for Education and Skills (2006) *The Languages Review consultation report: short text*. London: DfES.
- Hodson, P. (2006) *Skills for a World Class Service – report on the skills requirement of employers and the role of schools and colleges in delivering young people with the right skills for the workplace*. Solihull: GoSKills (with Skills for Business; and Heads, Teachers and Industry).
- Leitch Review of Skills (2006) *Prosperity for all in the global economy – world class skills. Final Report*. Norwich: HMSO
- Mason, G., Williams, G., Cranmer, S. and Guile, D. (2003) *How much does higher education enhance the employability of graduates?* Bristol: Higher Education Funding Council for England. [www.hefce.ac.uk/pubs/rdreports/2003/rd13\\_03](http://www.hefce.ac.uk/pubs/rdreports/2003/rd13_03)
- QAA (2003) *Learning from subject review 1993-2001*. Gloucester: Quality Assurance Agency for Higher Education.

Paul, J-J. (forthcoming) The graduates in the knowledge and innovation society. In J Allen and R van der Velden (eds.) *The flexible professional in the knowledge society: general results of the REFLEX project*.

Schomburg, H. and Teichler, U. (2006) *Higher education and graduate employment in Europe – results from graduate surveys from twelve countries*. Dordrecht, The Netherlands: Springer.

Sector Skills Development Agency (2006) 'Small companies fail to invest in training, report shows'. SSDA News, 12 September 2006.

Teichler, U. (1999) Higher Education Policy and the World of Work: changing conditions and challenges. In *Higher Education Policy*, 12, pp 285-312.

Teichler, U. (ed) (2007) *Careers of university graduates – views and experiences in comparative perspectives*. Dordrecht, The Netherlands: Springer.

Tether, B., Mina, A., Consoli, D., and Gagliardi, D. (2005) *A literature review on skills and innovation. How does successful innovation impact on the demand for skills and how do skills drive innovation?* Department of Trade and Industry: report produced by ESRC Centre for Research on Innovation and Competition (CRIC), University of Manchester.

Van der Velden, R. (2003) *The flexible professional in the knowledge society*. Summary of research proposal to European Commission.



## Appendix A: Background to the study

This report is based on the results of a major international study of graduate employment. The study, *The Flexible Professional in the Knowledge Society –new demands on higher education in Europe (REFLEX)*, was funded by the European Commission as part of its 6<sup>th</sup> Framework programme, Priority 7 Citizens and Governance in a Knowledge Based Society (and by several national funds). The study was carried out collaboratively by research groups in 13 European countries (Austria, Belgium-Flanders, the Czech Republic, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Switzerland and the United Kingdom) and Japan. It was coordinated by the Research Centre for Education and the Labour Market from Maastricht University in the Netherlands. The UK part of the study was undertaken by the Centre for Higher Education Research and Information at the Open University.

The study had three strands:

- A country study highlighting the main structural and institutional factors that shape the relationship between higher education and work;
- A qualitative study on graduate competences in the knowledge society;
- A survey of higher education graduates five years after graduation.

The results of the survey which are presented in this report covered graduates from 11 of the countries involved in the study: Austria, the Czech Republic, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Switzerland and the UK. The graduates were selected from the 1999/2000 graduating cohort and were contacted by means of a mailed questionnaire (with the option of completing a web-based questionnaire) in the spring of 2005. Overall, 33,832 questionnaires were returned from these 11 countries, including 1,578 from UK graduates. For the UK sample this represented a response rate of 23%. The overall average response rate was 30%, varying from 20% in Spain to 45% in Norway (see Appendix B for detail of case numbers for each country). The samples were selected to be representative of the various national higher education (HE) populations of students enrolled on first degree or equivalent programmes considered to be the main 'exit' qualification with which graduates left higher education in 2000 and entered the labour market in that country. In the case of the UK, this was taken to be a bachelors degree, but in very many other countries the 1999/2000 graduating sample comprised wholly (or mainly) those with a masters degree. The UK sample also included a (very) small number of graduates from taught masters programmes who had previously completed a first degree in the same broad subject area, had enrolled on a taught masters programme (at the same institution) without loss of time and graduated from that programme in 1999/2000.

Due to data protection issues in the UK it is generally not possible to contact graduates directly. Hence, broad population data for graduates in the year 1999/2000 was provided by the Higher Education Statistics Agency (HESA). The sample itself was drawn either by HESA or the institutions themselves and was broadly representative of the first-degree graduating population.

Key sampling variables were field of study and type of institution. The UK sample was drawn from 43 higher education institutions covering a range of types of institution and locations. The achieved sample (i.e. those responding to the survey) was also broadly representative of the graduating population, though females were slightly over-represented, as Table A below shows:

**Table A: Comparison of graduating population, initial sample and achieved sample**

	Population, %	Initial sample, %	Achieved sample, %
Full-time	90	89	88
Female	55	53	61
Non-white	12	12	8
23 and under	70	69	64
24-27	12	12	14
28 and over	19	19	23

The extensive questionnaire comprised 11 sections as follows:

- A Study programme completed in 1999/2000
- B Other educational and related experiences
- C Transition from study to work
- D First job after graduation
- E Employment history and current situation
- F Current work
- G Work organisation
- H Competences
- I Evaluation of study programme
- J Values and orientations
- K Socio-biographic data

A copy of the UK questionnaire is available to download from the HEFCE web-site alongside this report under Publications/Research & evaluation/2008.

This study followed on from an earlier study, Higher Education and Graduate Employment in Europe (CHEERS), also funded by the European Commission (see, for example, Brennan et al, 2001; Schomburg and Teichler, 2006; Teichler (ed) 2007)

As in the previous study, the data collected in 11 countries and 11 different research teams have gone well beyond the topics usually covered by national surveys of this kind. For example, they included questions about the higher education experience and attitudes, values and competences in relation both to employment and to other areas of life. Extensive and complex data checking and cleaning processes have been time-consuming. However, given that the research teams involved were already highly experienced and most had been involved in the earlier CHEERS study, the project was able to build on previous work. Once again, this large-scale European study of graduate employment used a common cross-national research methodology.

This report is one of six reports commissioned by HEFCE. The full set of reports comprises:

- 1 The employment of UK graduates: comparisons with Europe
- 2 The context of higher education and employment: comparisons between different European countries
- 3 Subject differences in graduate employment across Europe
- 4 Competences possessed and required by European graduates
- 5 Age differences in graduate employment across Europe
- 6 Graduates' retrospective views of higher education

## Appendix B: Country codes and case numbers of respondents for each country

Country codes used in figures and tables are as follows:

UK=United Kingdom      AT=Austria      NO=Norway  
IT=Italy      DE=Germany      CZ=Czech Republic  
ES=Spain      NL=the Netherlands      CH=Switzerland  
FR=France      FI=Finland

Case numbers are as follows:

Overall	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
33,832	1,578	3,139	3,916	1,700	1,821	1,700	3,425	2,676	2,201	6,794	4,882

## Appendix C: Tables and charts

**Table A1: Economic sector of current employment (International Standard of Industrial Classification; 1-digit) by country (%)**

	Europe	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
A - Agriculture, hunting and forestry	1	1	0	2	1	1	1	0	1	0	2	1
B - Fishing	0	0	0	0	0	0	0	0	0	0	0	0
C - Mining and quarrying	1	1	0	3	0	0	0	0	0	2	0	0
D - Manufacturing	12	9	15	8	13	14	14	10	18	7	16	10
E - Electricity, gas and water supply	1	1	1	0	1	1	1	1	1	0	2	0
F - Construction	3	3	2	6	2	2	4	2	1	2	5	1
G - Wholesale and retail trade; repair of motor vehicles, MOT	5	4	5	6	6	4	3	4	5	3	5	4
H - Hotels and restaurants	1	1	1	1	0	0	0	1	0	0	1	1
I - Transport, storage and communications	4	3	4	5	6	3	3	3	6	2	4	3
J - Financial intermediation	6	6	7	7	4	6	4	6	4	2	5	9
K - Real estate, renting and business activities	18	19	29	12	15	23	20	22	17	12	15	20
L - Public administration and defence; compulsory social security	9	11	6	8	6	8	6	10	5	9	12	11
M - Education	18	22	13	20	17	18	24	18	21	19	17	17
N - Health and social work	16	17	13	11	25	14	15	19	17	38	11	16
O - Other community, social and personal service activities	5	4	3	10	5	5	5	4	4	2	6	6
P - Activities of private households as employers and undifferentiated goods and services	0	0	0	1	0	0	0	0	0	0	0	0
Q - Extraterritorial organisations and bodies	0	0	0	1	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100

**Qn G2: In what type of organisation do you work?**

**Table A2: Required competences rated highly overall, in main economic sector by country (% rating 5, 6, 7) – Real estate, renting and business activities**

Required level:	Total	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Ability to use computers and the internet	86.8%	83.1%	85.0%	81.7%	88.2%	93.1%	89.6%	76.8%	90.8%	82.6%	94.2%	87.3%
Ability to perform well under pressure	84.0%	88.6%	82.3%	79.8%	81.1%	92.8%	89.5%	77.7%	84.8%	79.7%	83.3%	88.0%
Ability to use time efficiently	83.8%	87.5%	83.5%	84.3%	81.2%	90.0%	90.6%	82.0%	86.0%	79.9%	81.7%	82.1%
Ability to rapidly acquire new knowledge	81.5%	74.3%	82.8%	79.7%	77.5%	90.0%	87.1%	72.7%	82.7%	72.8%	91.1%	77.0%
Ability to work productively with others	79.9%	83.2%	82.5%	76.6%	74.0%	84.5%	82.4%	78.7%	82.3%	64.0%	83.0%	78.0%
Mastery of your own field or discipline	79.6%	75.2%	81.6%	72.4%	79.9%	90.3%	85.0%	74.4%	65.8%	78.6%	84.7%	81.9%
Ability to coordinate activities	77.3%	81.6%	76.7%	75.1%	69.5%	88.0%	82.0%	69.1%	78.5%	63.7%	82.4%	78.2%
Analytical thinking	77.0%	72.8%	75.4%	60.8%	79.5%	86.2%	84.6%	73.6%	69.8%	66.4%	85.0%	81.5%
Ability to make your meaning clear to others	76.9%	83.9%	75.5%	78.9%	82.8%	75.6%	79.5%	76.0%	77.7%	80.0%	80.0%	67.9%
Ability to write reports, memos or documents	76.5%	73.3%	80.6%	75.4%	76.8%	82.9%	74.5%	67.7%	72.7%	71.9%	83.1%	74.8%
Ability to come up with new ideas and solutions	74.9%	67.2%	74.7%	74.4%	71.2%	80.6%	80.2%	71.9%	73.3%	67.9%	81.2%	72.4%
Willingness to question your own and others' ideas	67.3%	62.8%	72.1%	58.4%	64.0%	66.5%	67.9%	66.7%	62.8%	58.0%	79.5%	61.7%
Ability to present products, ideas or reports to an audience	63.8%	53.5%	68.0%	58.8%	68.7%	74.1%	69.3%	55.9%	63.5%	62.9%	64.3%	64.5%
Ability to negotiate effectively	63.1%	57.8%	72.8%	58.8%	48.0%	71.3%	63.9%	54.3%	64.9%	44.1%	70.0%	62.0%
Alertness to new opportunities	62.6%	57.4%	72.8%	54.2%	51.2%	73.9%	72.8%	65.3%	67.7%	62.6%	53.9%	58.9%
Ability to mobilise the capacities of others	59.6%	54.1%	69.1%	53.0%	51.2%	65.8%	57.7%	62.4%	63.5%	49.8%	59.7%	54.5%
Ability to assert your authority	54.6%	54.5%	63.3%	52.9%	52.7%	54.6%	54.1%	46.2%	49.0%	42.7%	67.1%	46.4%
Ability to write and speak in a foreign language	49.2%	10.1%	44.5%	33.7%	39.2%	55.7%	47.9%	38.4%	65.3%	43.9%	70.6%	54.8%
Knowledge of other fields or disciplines	48.4%	37.6%	50.6%	44.9%	39.3%	61.5%	52.3%	41.5%	52.0%	43.7%	56.1%	43.8%

**Qn H1: What is the required level of competence in your current work?**

**Table A3: Required competences rated highly overall, in main economic sector by country (% rating 5, 6, 7) – Education**

Required level:	Total	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Mastery of your own field or discipline	80.8%	77.7%	82.1%	75.5%	62.6%	86.1%	85.8%	83.8%	80.7%	79.9%	86.8%	77.7%
Ability to use time efficiently	80.2%	91.4%	79.8%	83.2%	79.1%	83.2%	83.3%	82.1%	81.6%	73.8%	80.7%	70.2%
Ability to coordinate activities	78.2%	85.1%	78.4%	79.1%	66.2%	82.2%	85.5%	78.2%	75.7%	74.1%	83.0%	69.0%
Ability to make your meaning clear to others	78.2%	87.4%	71.7%	88.9%	88.5%	72.8%	68.3%	80.4%	78.4%	87.1%	77.8%	63.5%
Ability to rapidly acquire new knowledge	74.5%	72.1%	79.3%	70.9%	62.8%	77.7%	83.2%	63.5%	77.8%	70.5%	82.0%	71.8%
Ability to come up with new ideas and solutions	74.3%	71.8%	76.4%	77.6%	59.1%	72.4%	75.9%	75.7%	80.1%	69.3%	76.4%	71.1%
Ability to work productively with others	74.2%	88.6%	81.6%	78.0%	65.9%	75.9%	75.7%	77.0%	69.4%	72.0%	72.3%	66.7%
Ability to use computers and the internet	73.0%	80.1%	77.1%	64.1%	56.4%	76.6%	72.4%	62.8%	76.2%	68.6%	81.8%	75.9%
Ability to write reports, memos or documents	72.2%	76.4%	80.2%	73.6%	53.9%	71.6%	78.0%	58.7%	64.5%	68.5%	79.8%	74.8%
Ability to perform well under pressure	71.4%	83.6%	71.6%	63.7%	46.4%	78.9%	87.2%	70.5%	73.1%	73.3%	71.0%	70.2%
Willingness to question your own and others' ideas	68.3%	69.1%	71.5%	61.8%	61.1%	63.4%	67.0%	69.1%	67.6%	68.6%	75.7%	65.3%
Ability to present products, ideas or reports to an audience	68.1%	64.6%	68.1%	69.8%	59.1%	75.9%	77.7%	53.6%	68.0%	62.4%	70.2%	74.5%
Ability to assert your authority	66.7%	79.2%	68.8%	71.9%	84.1%	70.1%	80.5%	65.3%	44.9%	71.5%	66.9%	52.9%
Analytical thinking	64.5%	57.3%	71.3%	60.5%	68.5%	62.3%	62.9%	53.0%	67.4%	51.5%	70.7%	73.3%
Ability to mobilise the capacities of others	61.8%	68.9%	71.0%	60.9%	56.3%	75.9%	72.8%	63.2%	62.4%	62.3%	53.4%	56.9%
Alertness to new opportunities	54.5%	56.9%	67.6%	45.0%	27.4%	65.4%	68.1%	58.8%	67.1%	60.1%	44.9%	53.6%
Ability to negotiate effectively	51.6%	52.7%	58.4%	44.9%	30.8%	45.9%	55.7%	39.1%	53.9%	50.4%	71.7%	37.1%
Knowledge of other fields or disciplines	43.7%	39.4%	48.9%	44.3%	42.1%	41.9%	49.4%	33.8%	41.2%	32.6%	55.7%	36.9%
Ability to write and speak in a foreign language	42.3%	12.2%	49.8%	37.3%	30.3%	54.9%	39.4%	22.7%	54.1%	38.8%	49.2%	57.7%

**Qn H1: What is the required level of competence in your current work?**

**Table A4: Required competences rated highly overall, in main economic sector by country (% rating 5, 6, 7) – Health and social work**

Competence	Total	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Mastery of your own field or discipline	81.8%	68.3%	84.1%	83.4%	79.6%	89.7%	89.8%	81.3%	81.5%	78.4%	88.2%	78.6%
Ability to use time efficiently	81.5%	86.5%	80.2%	80.4%	81.7%	81.3%	85.7%	82.0%	86.8%	77.4%	83.6%	78.0%
Ability to perform well under pressure	80.4%	79.6%	79.6%	79.2%	69.0%	88.7%	90.1%	76.3%	88.0%	78.6%	79.6%	84.6%
Ability to work productively with others	80.0%	87.1%	80.1%	82.6%	77.9%	76.8%	81.8%	81.2%	81.4%	76.2%	81.0%	79.1%
Ability to make your meaning clear to others	74.2%	84.7%	69.5%	81.5%	77.7%	57.0%	66.5%	78.7%	76.8%	82.5%	73.4%	59.5%
Ability to coordinate activities	73.9%	79.8%	70.6%	66.0%	68.3%	82.9%	80.8%	68.5%	75.7%	74.3%	78.7%	73.8%
Ability to rapidly acquire new knowledge	70.4%	70.1%	77.0%	76.5%	68.3%	76.7%	72.8%	64.7%	75.0%	57.6%	85.8%	63.3%
Ability to write reports, memos or documents	65.0%	63.4%	72.3%	57.7%	52.7%	66.0%	70.0%	55.4%	60.1%	72.3%	70.9%	67.2%
Ability to come up with new ideas and solutions	61.3%	52.4%	68.4%	67.0%	55.6%	57.5%	63.1%	68.3%	66.0%	56.8%	65.6%	52.8%
Analytical thinking	61.1%	61.4%	71.2%	58.7%	75.2%	69.5%	64.2%	64.9%	53.0%	39.1%	72.0%	61.5%
Ability to mobilise the capacities of others	60.8%	64.3%	68.1%	60.5%	61.5%	50.3%	64.5%	70.5%	59.3%	65.8%	55.0%	49.2%
Willingness to question your own and others' ideas	59.8%	60.0%	66.9%	56.6%	50.4%	44.9%	58.9%	70.2%	55.9%	58.3%	69.1%	52.9%
Ability to use computers and the internet	59.3%	56.3%	61.9%	56.1%	36.6%	65.3%	61.8%	51.8%	70.7%	50.7%	81.0%	58.0%
Ability to assert your authority	56.0%	63.6%	60.0%	62.4%	64.8%	51.0%	60.6%	50.2%	45.1%	55.9%	61.8%	48.5%
Alertness to new opportunities	54.4%	54.7%	61.8%	46.4%	25.9%	73.4%	63.1%	64.0%	64.9%	59.0%	43.7%	51.7%
Ability to negotiate effectively	54.0%	60.4%	58.5%	52.5%	35.3%	52.6%	52.0%	50.0%	61.1%	45.2%	70.2%	54.1%
Ability to present products, ideas or reports to an audience	47.8%	44.6%	58.3%	46.0%	45.6%	51.8%	55.0%	41.4%	42.9%	38.5%	63.1%	45.4%
Knowledge of other fields or disciplines	39.9%	36.2%	41.8%	39.4%	30.4%	44.6%	46.1%	41.9%	36.4%	33.4%	55.5%	33.9%
Ability to write and speak in a foreign language	24.5%	5.0%	39.4%	29.4%	10.3%	28.6%	21.3%	14.9%	30.4%	12.2%	42.4%	30.4%

**Qn H1: What is the required level of competence in your current work?**



**Table A5: Required competences rated highly overall, in main economic sector by country (% rating 5, 6, 7) – Manufacturing**

Competence	Total	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Ability to perform well under pressure	84.3%	81.0%	83.8%	79.6%	78.4%	93.8%	92.1%	82.0%	82.9%	82.2%	85.8%	83.0%
Ability to use computers and the internet	83.7%	73.2%	79.8%	75.8%	64.9%	95.8%	90.6%	79.9%	84.7%	75.2%	91.7%	80.5%
Ability to use time efficiently	83.1%	82.5%	82.8%	80.8%	81.2%	92.7%	89.0%	80.9%	83.5%	76.6%	84.8%	77.4%
Ability to work productively with others	80.1%	80.3%	83.2%	75.7%	72.9%	91.5%	90.0%	75.8%	83.2%	67.4%	80.1%	76.6%
Ability to coordinate activities	78.7%	76.6%	78.5%	74.8%	70.8%	88.1%	86.9%	69.8%	77.3%	71.3%	83.9%	74.2%
Ability to rapidly acquire new knowledge	77.8%	66.9%	74.1%	72.2%	68.5%	82.2%	85.2%	72.6%	80.5%	60.5%	88.5%	67.4%
Mastery of your own field or discipline	76.4%	68.3%	78.0%	72.5%	72.4%	92.1%	90.5%	79.6%	63.4%	69.8%	80.5%	70.3%
Ability to make your meaning clear to others	76.1%	76.0%	69.1%	76.3%	81.3%	79.8%	78.5%	79.0%	79.2%	78.1%	80.1%	61.4%
Ability to come up with new ideas and solutions	76.0%	68.0%	75.5%	71.4%	64.1%	82.9%	86.3%	75.2%	78.5%	70.5%	78.7%	72.6%
Analytical thinking	74.9%	67.2%	75.4%	63.5%	71.2%	86.7%	85.7%	70.4%	69.2%	58.6%	81.4%	74.2%
Ability to write reports, memos or documents	70.9%	58.3%	69.5%	71.8%	58.2%	80.9%	76.3%	57.8%	69.8%	55.8%	80.3%	66.3%
Willingness to question your own and others' ideas	69.0%	63.8%	72.5%	64.4%	49.4%	74.6%	71.7%	69.6%	73.1%	63.3%	73.8%	60.7%
Ability to write and speak in a foreign language	63.1%	8.8%	59.0%	52.8%	44.4%	75.3%	65.6%	62.0%	72.4%	49.6%	73.6%	63.9%
Ability to negotiate effectively	61.7%	60.3%	70.7%	61.5%	49.7%	70.3%	60.7%	52.6%	58.5%	39.5%	71.3%	48.2%
Ability to mobilise the capacities of others	61.3%	55.9%	67.4%	62.0%	62.9%	68.4%	66.3%	64.3%	66.0%	57.8%	59.2%	49.0%
Alertness to new opportunities	60.4%	50.8%	69.7%	53.4%	37.0%	77.2%	73.7%	70.6%	66.1%	58.5%	54.3%	57.0%
Ability to present products, ideas or reports to an audience	58.1%	44.4%	63.1%	60.5%	52.4%	78.4%	64.9%	52.4%	57.8%	47.7%	59.8%	48.4%
Ability to assert your authority	55.8%	43.5%	62.0%	62.3%	54.7%	60.5%	58.1%	45.2%	48.1%	46.9%	66.4%	37.6%
Knowledge of other fields or disciplines	47.0%	29.1%	40.1%	43.4%	35.9%	60.4%	57.7%	41.7%	45.3%	31.0%	55.1%	46.1%

**Qn H1: What is the required level of competence in your current work?**

**Table A6: Required competences rated highly overall, in main economic sector by country (% rating 5, 6, 7) – Public administration and defence, compulsory social security**

Required level:	Total	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Ability to write reports, memos or documents	79.8%	73.6%	81.0%	70.6%	78.0%	76.2%	85.4%	77.8%	79.6%	73.9%	88.9%	74.3%
Mastery of your own field or discipline	77.2%	67.8%	79.3%	64.7%	78.3%	86.9%	89.7%	77.0%	74.8%	71.8%	84.2%	71.6%
Ability to perform well under pressure	75.7%	84.1%	68.3%	59.6%	87.7%	82.6%	87.5%	72.7%	78.4%	73.3%	79.0%	74.2%
Ability to use computers and the internet	74.5%	74.1%	73.6%	70.1%	59.8%	80.6%	83.0%	59.3%	87.5%	64.1%	86.5%	66.4%
Ability to rapidly acquire new knowledge	74.2%	66.2%	71.6%	60.7%	78.0%	80.6%	88.6%	70.7%	83.3%	59.7%	85.3%	65.9%
Ability to make your meaning clear to others	74.0%	77.2%	59.6%	73.2%	83.1%	76.4%	76.1%	78.4%	72.8%	76.4%	76.8%	65.6%
Ability to use time efficiently	73.9%	83.4%	67.2%	68.5%	81.7%	74.1%	84.3%	72.6%	81.2%	63.5%	78.6%	66.7%
Ability to coordinate activities	70.2%	74.3%	68.3%	63.0%	62.2%	71.7%	63.6%	69.0%	74.5%	58.6%	77.6%	67.8%
Ability to work productively with others	69.5%	82.9%	70.8%	59.6%	75.9%	71.6%	66.7%	78.6%	71.2%	56.4%	70.4%	66.4%
Analytical thinking	67.9%	57.3%	64.7%	45.5%	84.5%	76.2%	75.3%	73.1%	71.8%	50.6%	74.3%	70.3%
Ability to negotiate effectively	59.6%	59.3%	59.6%	38.7%	61.0%	75.2%	68.2%	50.9%	58.8%	42.9%	73.8%	53.0%
Ability to come up with new ideas and solutions	58.7%	51.7%	63.4%	58.1%	56.1%	54.7%	54.5%	64.9%	65.7%	47.8%	63.1%	52.7%
Willingness to question your own and others' ideas	57.2%	54.2%	62.0%	42.1%	66.3%	53.4%	46.6%	69.0%	54.8%	43.9%	64.8%	51.2%
Ability to present products, ideas or reports to an audience	55.4%	46.9%	57.8%	50.2%	59.0%	61.7%	53.9%	54.9%	66.0%	42.5%	61.5%	50.7%
Ability to assert your authority	55.1%	58.7%	64.5%	46.8%	61.7%	64.5%	52.8%	48.3%	46.6%	50.0%	60.6%	50.7%
Ability to mobilise the capacities of others	50.0%	56.9%	63.5%	45.1%	53.0%	48.6%	40.2%	60.4%	55.4%	42.5%	47.5%	46.6%
Knowledge of other fields or disciplines	46.4%	35.9%	48.5%	41.5%	42.2%	57.4%	46.0%	44.3%	57.8%	35.9%	54.4%	38.5%
Alertness to new opportunities	43.1%	48.3%	60.1%	33.6%	35.4%	52.4%	42.0%	55.6%	59.6%	45.6%	36.1%	38.4%
Ability to write and speak in a foreign language	28.8%	6.3%	40.6%	17.4%	22.0%	37.0%	20.5%	15.6%	42.7%	24.7%	36.1%	35.9%

**Qn H1: What is the required level of competence in your current work?**

**Table A7: Public or private sector by country (%)**

	All	UK	IT	ES	FR	AT	DE	NL	FI	NO	CZ	CH
Public sector	41	49	28	32	43	38	42	51	43	61	36	44
Private non-profit sector	7	7	12	7	8	10	6	11	4	8	3	8
Private for-profit sector	50	43	59	59	50	51	51	36	51	30	58	47
Other	2	1	1	2	0	1	0	2	2	1	3	1
Total	100	100	100	100	100	100	100	100	100	100	100	100

**Qn G3: Do you work in the public or private sector?**

**Table A8: Strong points of the study programme by country (%)**

	Total	IT	ES	FR	AT	DE	NL	UK	FI	NO	CZ	CH
Mastery of your own field or discipline	42	39	33	36	39	42	36	25	54	51	50	43
Knowledge of other fields or disciplines	11	10	8	11	12	10	8	5	6	7	20	13
Analytical thinking	36	36	29	43	41	41	35	34	35	33	28	52
Ability to rapidly acquire new knowledge	31	25	32	29	39	39	20	24	28	22	39	36
Ability to negotiate effectively	4	10	5	3	2	2	4	7	4	4	3	3
Ability to perform well under pressure	19	19	21	23	19	21	15	28	13	20	16	22
Alertness to new opportunities	4	5	2	3	8	4	6	3	6	6	1	5
Ability to coordinate activities	10	13	14	10	7	6	14	14	8	11	10	6
Ability to use time efficiently	13	15	17	18	12	10	11	23	10	9	12	13
Ability to work productively with others	20	18	35	18	15	19	35	27	20	25	11	11
Ability to mobilise the capacities of others	4	5	4	4	2	2	6	3	3	9	1	3
Ability to make your meaning clear to others	9	8	15	13	6	7	10	12	5	13	8	6
Ability to assert your authority	3	4	3	4	1	1	3	4	1	4	3	1
Ability to use computers and the internet	18	13	11	10	14	13	15	21	25	12	31	12
Ability to come up with new ideas and solutions	11	8	12	9	12	15	18	10	13	11	5	14
Willingness to question your own and others' ideas	9	9	9	9	9	7	11	13	11	13	6	10
Ability to present products, ideas or reports to an audience	12	7	13	12	19	19	19	13	11	10	7	13
Ability to write reports, memos or documents	23	13	20	23	20	22	20	21	30	28	26	22
Ability to write and speak in a foreign language	9	9	6	8	11	7	7	6	15	4	10	9
Total	100	100	100	100	100	100	100	100	100	100	100	100

**Qn H2A: Name a maximum of three competences from the list above that you regard as strong points and a maximum of three competences that you regard as weak points of your study programme**

**Table A9: Weak points of the study programme by country (%)**

	Total	IT	ES	FR	AT	DE	NL	UK	FI	NO	CZ	CH
Mastery of your own field or discipline	6	6	6	6	5	5	6	5	3	3	5	14
Knowledge of other fields or disciplines	17	17	17	12	19	20	15	19	27	19	14	14
Analytical thinking	10	3	8	4	6	7	12	8	11	11	10	21
Ability to rapidly acquire new knowledge	4	3	2	3	2	2	3	4	2	2	3	11
Ability to negotiate effectively	24	16	26	29	25	26	30	26	30	26	19	22
Ability to perform well under pressure	9	11	10	9	6	5	9	5	10	8	9	8
Alertness to new opportunities	13	9	15	11	10	10	11	15	6	9	18	18
Ability to coordinate activities	8	9	6	6	8	9	9	5	12	7	5	12
Ability to use time efficiently	12	7	5	9	10	12	17	11	10	10	8	25
Ability to work productively with others	9	9	8	6	12	14	6	5	8	11	11	9
Ability to mobilise the capacities of others	16	10	14	13	18	19	16	20	22	20	18	10
Ability to make your meaning clear to others	6	6	5	7	8	7	7	7	7	5	8	4
Ability to assert your authority	26	21	20	33	26	27	32	32	37	27	29	16
Ability to use computers and the internet	18	21	31	23	22	20	17	15	13	28	14	5
Ability to come up with new ideas and solutions	10	7	7	9	18	16	10	10	15	10	11	5
Willingness to question your own and others' ideas	7	7	9	6	9	9	10	9	13	11	3	4
Ability to present products, ideas or reports to an audience	22	19	26	20	25	26	23	28	23	27	28	9
Ability to write reports, memos or documents	11	12	12	14	10	11	22	10	11	12	9	6
Ability to write and speak in a foreign language	41	48	62	52	45	38	29	51	31	35	55	13
Total	100	100	100	100	100	100	100	100	100	100	100	100

**Qn H2A: Name a maximum of three competences from the list above that you regard as strong points and a maximum of three competences that you regard as weak points of your study programme**

**Table A10: Highly required competences in manufacturing, for those having a role in introducing innovations in product or service – rank ordered by overall and by UK, France and Germany (per cent; responses 5,6,7) [Highly required competences for all graduates working in manufacturing shown in brackets]**

	All	UK	France	Germany
Ability to perform well under pressure	87 (84)	86 (81)	91 (78)	93 (92)
Ability to use computers and the internet	85 (84)	76 (73)	75 (65)	87 (91)
Ability to use time efficiently	85 (83)	90 (83)	86 (81)	90 (89)
Ability to work productively with others	84 (80)	85 (80)	77 (73)	91 (90)
Ability to come up with new ideas and solutions	84 (76)	83 (68)	81 (64)	91 (86)
Ability to coordinate activities	83 (79)	88 (77)	76 (71)	88 (87)
Ability to rapidly acquire new knowledge	81 (78)	77 (67)	84 (69)	91 (85)
Ability to make your meaning clear to others	80 (76)	85 (76)	84 (81)	80 (79)
Analytical thinking	79 (75)	77 (67)	84 (71)	91 (86)
Mastery of your own field or discipline	78 (76)	72 (68)	75 (72)	90 (91)
Willingness to question your own and others' ideas	75 (69)	79 (64)	47 (49)	76 (72)
Ability to write reports, memos or documents	73 (71)	62 (58)	61 (58)	80 (76)
Alertness to new opportunities	69 (60)	59 (51)	53 (37)	78 (74)
Ability to negotiate effectively	67 (62)	67 (60)	66 (50)	70 (61)
Ability to mobilise the capacities of others	67 (61)	70 (56)	67 (63)	70 (66)
Ability to write and speak in a foreign language	67 (63)	7 (9)	50 (44)	73 (66)
Ability to present products, ideas or reports to an audience	65 (58)	57 (44)	63 (52)	69 (65)
Ability to assert your authority	59 (56)	57 (44)	64 (55)	58 (58)
Knowledge of other fields or disciplines	51 (47)	35 (29)	43 (36)	60 (58)

**Table A11: Highly required competences in manufacturing, for those having a role in introducing innovations in technology, tools or instruments – rank ordered by overall and by UK, France and Germany (per cent; responses 5,6,7) [Highly required competences for all graduates working in manufacturing shown in brackets]**

	All	UK	France	Germany
Ability to perform well under pressure	86 (84)	80 (81)	79 (78)	93 (92)
Ability to use computers and the internet	85 (84)	77 (73)	73 (65)	88 (91)
Ability to use time efficiently	84 (83)	86 (83)	84 (81)	87 (89)
Ability to come up with new ideas and solutions	83 (76)	72 (68)	76 (64)	92 (86)
Ability to work productively with others	82 (80)	84 (80)	78 (73)	87 (90)
Analytical thinking	81 (75)	80 (67)	80 (71)	94 (86)
Ability to rapidly acquire new knowledge	81 (78)	77 (67)	71 (69)	90 (85)
Ability to coordinate activities	81 (79)	76 (77)	71 (71)	87 (87)
Ability to make your meaning clear to others	80 (76)	80 (76)	79 (81)	82 (79)
Mastery of your own field or discipline	80 (76)	79 (68)	78 (72)	92 (91)
Willingness to question your own and others' ideas	77 (69)	71 (64)	54 (49)	82 (72)
Ability to write reports, memos or documents	73 (71)	58 (58)	59 (58)	76 (76)
Ability to mobilise the capacities of others	68 (61)	61 (56)	65 (63)	76 (66)
Ability to write and speak in a foreign language	66 (63)	5 (9)	46 (44)	69 (66)
Alertness to new opportunities	64 (60)	52 (51)	39 (37)	76 (74)
Ability to negotiate effectively	61 (62)	54 (60)	59 (50)	57 (61)
Ability to present products, ideas or reports to an audience	60 (58)	38 (44)	54 (52)	66 (65)
Ability to assert your authority	58 (56)	46 (44)	54 (55)	65 (58)
Knowledge of other fields or disciplines	51 (47)	34 (29)	41 (36)	64 (58)

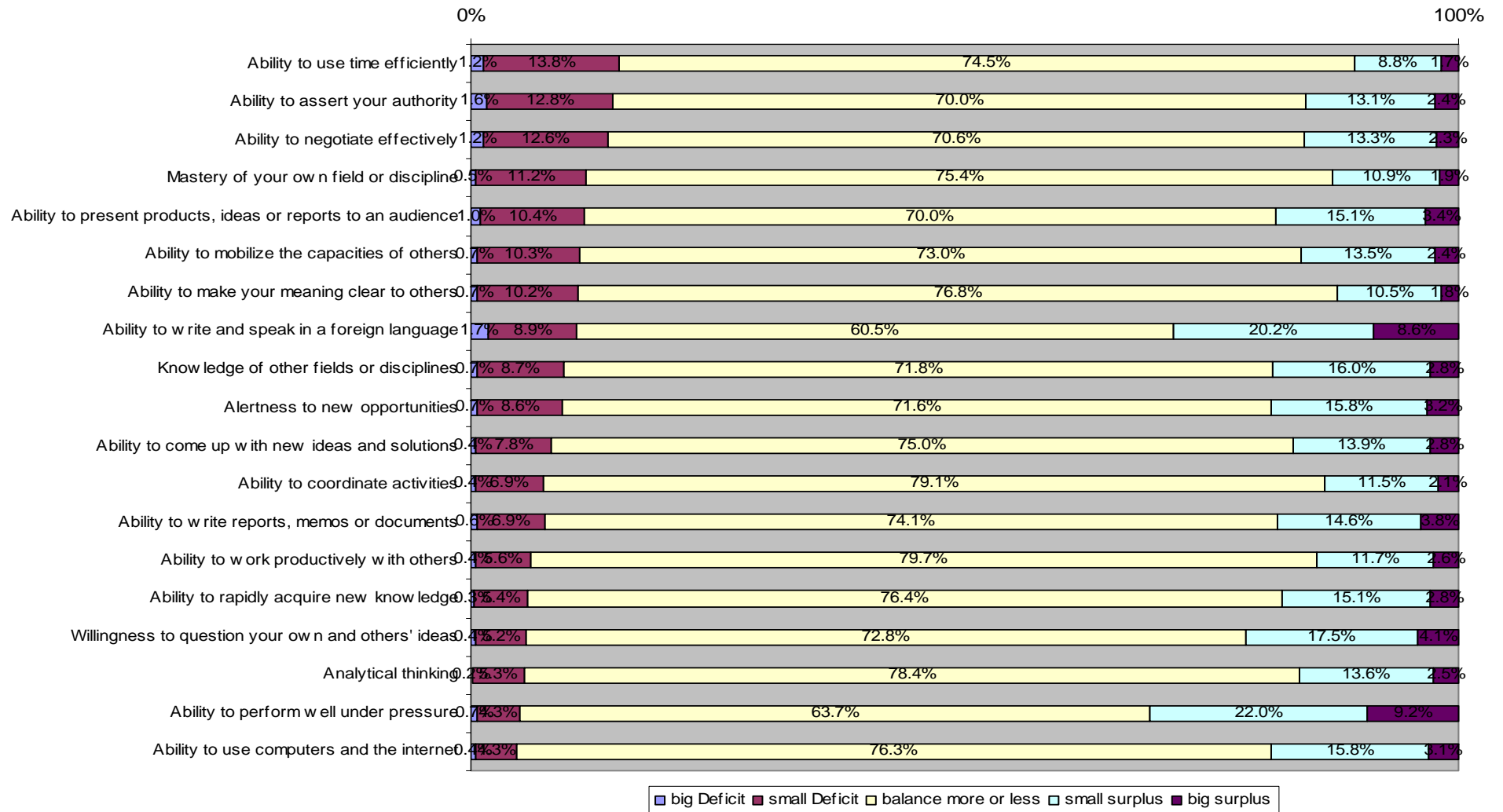
**Table A12: Highly required competences in manufacturing, for those having a role in introducing innovations in knowledge or methods – rank ordered by overall and by UK, France and Germany (per cent; responses 5,6,7) [Highly required competences for all graduates working in manufacturing shown in brackets]**

	All	UK	France	Germany
Ability to perform well under pressure	87 (84)	81 (81)	77 (78)	95 (92)
Ability to use computers and the internet	86 (84)	76 (73)	66 (65)	91 (91)
Ability to use time efficiently	85 (83)	83 (83)	79 (81)	93 (89)
Ability to work productively with others	84 (80)	83 (80)	76 (73)	92 (90)
Ability to coordinate activities	83 (79)	83 (77)	77 (71)	91 (87)
Ability to come up with new ideas and solutions	82 (76)	73 (68)	73 (64)	95 (86)
Ability to rapidly acquire new knowledge	82 (78)	72 (67)	72 (69)	89 (85)
Analytical thinking	81 (75)	79 (67)	77 (71)	90 (86)
Ability to make your meaning clear to others	81 (76)	81 (76)	86 (81)	87 (79)
Mastery of your own field or discipline	80 (76)	72 (68)	77 (72)	91 (91)
Ability to write reports, memos or documents	76 (71)	62 (58)	64 (58)	77 (76)
Willingness to question your own and others' ideas	75 (69)	73 (64)	53 (49)	80 (72)
Ability to write and speak in a foreign language	67 (63)	7 (9)	48 (44)	73 (66)
Ability to mobilise the capacities of others	67 (61)	62 (56)	65 (63)	75 (66)
Ability to negotiate effectively	66 (62)	63 (60)	53 (50)	70 (61)
Alertness to new opportunities	66 (60)	51 (51)	43 (37)	84 (74)
Ability to present products, ideas or reports to an audience	64 (58)	48 (44)	57 (52)	72 (65)
Ability to assert your authority	61 (56)	51 (44)	58 (55)	64 (58)
Knowledge of other fields or disciplines	51 (47)	33 (29)	41 (36)	62 (58)

**Table A13: Graduates' ratings of highly required competences, rank ordered by overall and detailed by size of organisation (overall and UK)**

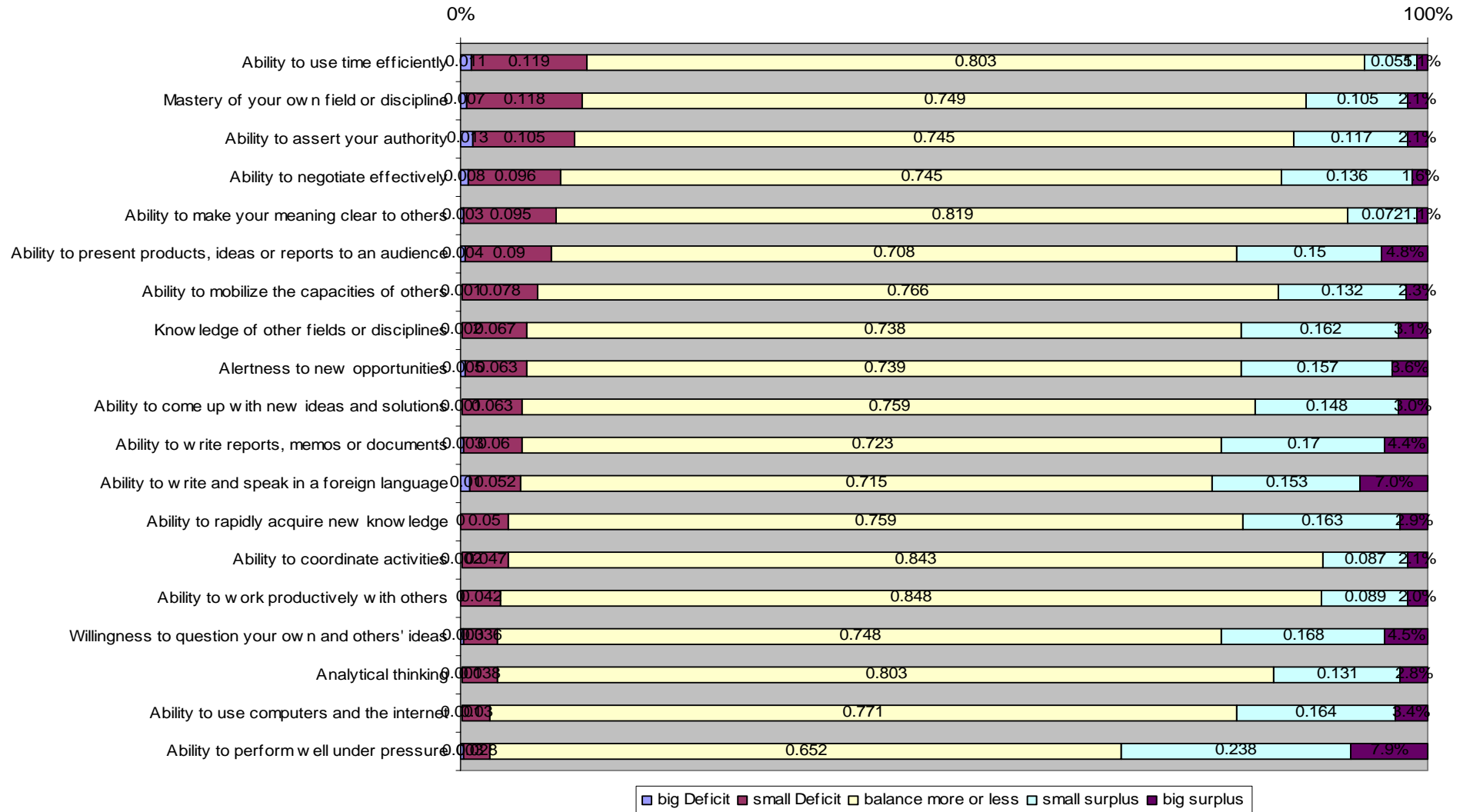
	Overall		1-9 employees		10-49 employees		50-99 employees		100-249 employees		250-999 employees		1000+ employees	
	All	UK	All	UK	All	UK	All	UK	All	UK	All	UK	All	UK
Ability to use time efficiently	81	87	80	89	81	85	84	91	80	91	82	88	76	70
Ability to perform well under pressure	80	84	79	81	79	78	80	83	80	86	82	87	84	91
Mastery of your own field or discipline	78	73	77	75	78	68	78	77	76	74	78	74	78	69
Ability to work productively with others	77	85	75	82	77	82	77	86	78	85	82	83	82	87
Ability to rapidly acquire new knowledge	76	70	74	71	75	68	74	70	75	71	76	74	78	76
Ability to coordinate activities	76	80	76	83	76	77	75	78	74	80	76	74	76	83
Ability to make your meaning clear to others	76	82	75	85	75	80	76	85	75	82	76	81	79	87
Ability to use computers and the internet	76	75	75	73	75	68	76	71	79	81	80	79	80	77
Ability to write reports, memos or documents	71	69	68	65	71	66	70	68	72	67	72	75	72	78
Ability to come up with new ideas and solutions	70	64	70	69	68	55	67	63	70	62	71	64	73	66
Analytical thinking	69	65	65	57	66	58	70	66	72	68	76	70	77	72
Willingness to question your own and others' ideas	65	64	64	60	64	59	63	60	65	62	64	64	67	70
Ability to negotiate effectively	60	58	66	65	59	57	56	60	54	52	57	52	55	69
Ability to mobilise the capacities of others	60	61	59	54	59	61	59	66	58	56	61	62	65	69
Ability to present products, ideas or reports to an audience	59	52	60	52	57	47	58	56	57	47	58	55	36	58
Ability to assert your authority	58	62	57	59	57	59	58	66	56	57	52	54	55	73
Alertness to new opportunities	57	56	62	59	55	51	55	56	53	55	56	53	60	66
Knowledge of other fields or disciplines	45	37	46	38	45	36	40	31	43	36	45	37	45	37
Ability to write and speak in a foreign language	43	9	37	13	39	5	44	7	49	10	52	8	55	8

**Chart C1: Difference between required and possessed competences, Europe overall (rank ordered by overall proportion of competence deficit)**

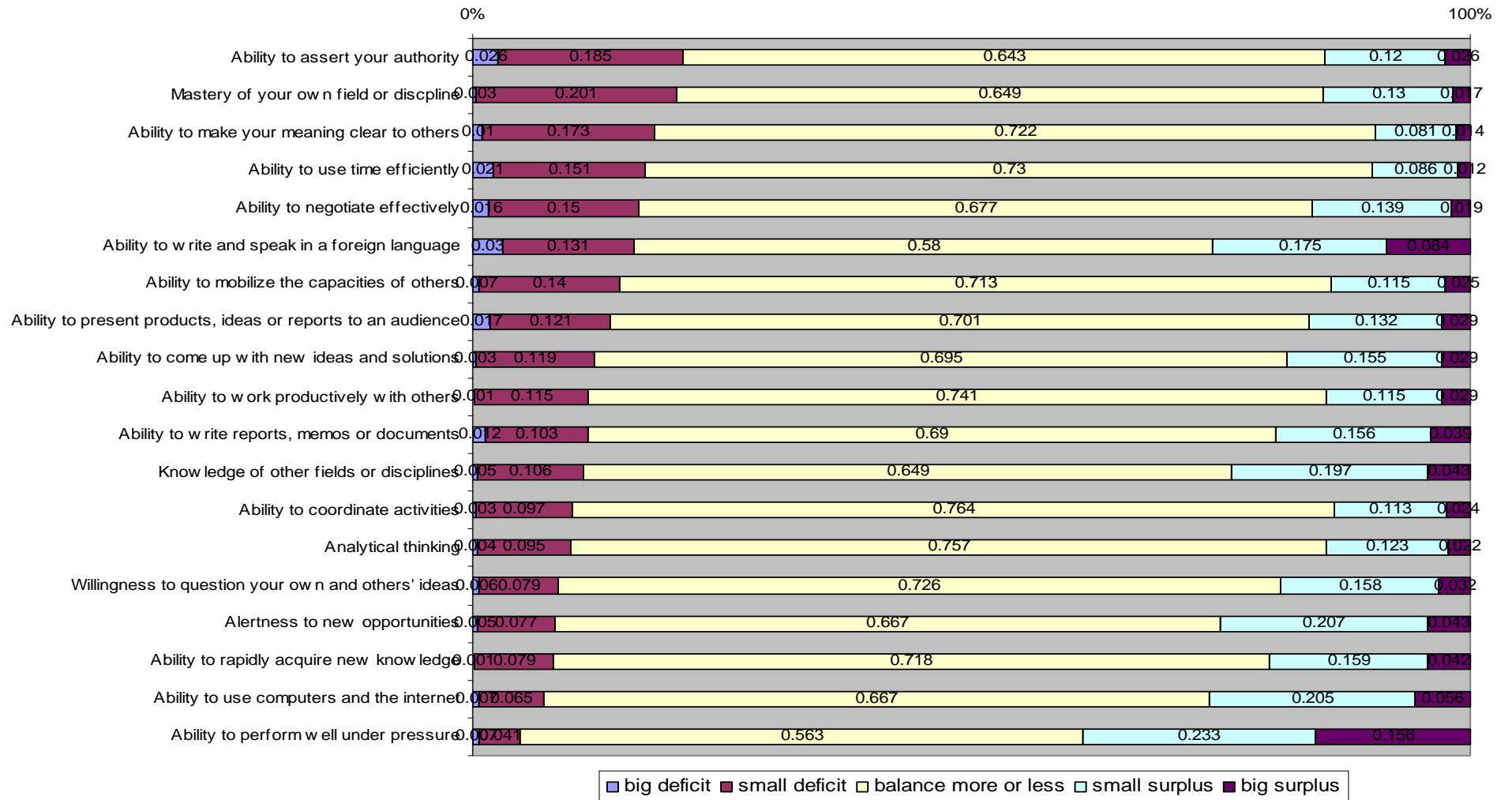




**Chart C2: Difference between required and possessed competences, UK (rank ordered by overall proportion of competence deficit)**



**Chart C3: Difference between required and possessed competences, France (rank ordered by overall proportion of competence deficit)**



**Chart C4: Difference between required and possessed competences, Germany (rank ordered by overall proportion of competence deficit)**

