

Chapter 7: Graduate Skill Gaps and Employer-Provided Training

7.1 Managers' assessments of skills lacked by graduates

When asked about the skills and knowledge that individual graduates had when they started their current jobs, only 28% of line managers said that graduates had 'all or most' of the necessary skills and knowledge. Just under two-thirds said the graduates had 'some' of the required skills while 4% said they had 'none of them'.

As Table 7.1 shows, this ratio of initial satisfaction to dissatisfaction applied to all subject areas except design studies, where some 54% of graduates were rated as having 'most' of the required skills; however, no statistical significance can be attached to this finding due to the small number of design graduates in the sample.

Line managers who said that graduates only had some or none of the required skills and knowledge when they started their jobs were then asked an open question about what *types* of skills were lacking. Some subject-related differences can be identified in the pattern of responses. For example, the managers of computer studies graduates cited gaps in programming/IT skills, communication skills and 'other skills/knowledge'. The latter is a large residual category which covered, for example, office skills, manual skills, marketing, problem-solving, legal knowledge and unspecified 'knowledge of the particular industry' (see notes to Table 7.1). In all the other subjects this residual category represented the largest (or equal largest) set of skills said to be lacking. Other problem areas were product knowledge or technical knowledge (said to be lacking by one in five of all graduates in biological sciences, business studies and history) and communication skills of various kinds (reported by 15-18% of line managers of computer studies and history graduates).

Table 7.1: Line managers' assessments of skills lacked by graduate when he/she started current job

	Biological sciences	Business studies	Computer studies	Design studies	History	TOTAL (a)
L1 Please think about the skills and knowledge that (graduate) had when s/he started in this job. Would you say that s/he had.....						
All of the necessary skills and knowledge	0	3	0	0	0	1
Most of them	31	23	24	54	20	27
Some of them	63	70	74	46	60	65
None of them	3	5	3	0	5	4
Don't know / can't say	3	0	0	0	15	3
TOTAL	100	100	100	100	100	100
What type of skills did they lack?						
% of LMs reporting some or all skills lacking	66	75	76	46	65	69
Types of skills reported lacking						
				<i>% of those reporting some or all skills lacking</i>		
L201	Real world skills, practical experience	14	8	8	50	13
L202	Product knowledge / technical knowledge	33	29	15	0	26
L203	Programming / IT skills	10	14	38	33	20
L204	Communication skills	10	10	23	0	14
L205	Dealing with colleagues	14	10	8	0	9
L206	Dealing with clients	5	10	8	0	8
L207	Working in this particular organisation	14	14	4	17	12
L208	Other skills / knowledge	48	37	31	50	36
L209	Confidence	10	10	0	0	10
				<i>% of all survey respondents</i>		
L201	Real world skills, practical experience	9	6	6	23	9
L202	Product knowledge / technical knowledge	22	22	12	0	18
L203	Programming / IT skills	6	10	29	15	14
L204	Communication skills	6	8	18	0	9
L205	Dealing with colleagues	9	8	6	0	6
L206	Dealing with clients	3	8	6	0	5
L207	Working in this particular organisation	9	10	3	8	8
L208	Other skills / knowledge	31	28	24	23	25
L209	Confidence	6	8	0	0	7
		<i>n=32</i>	<i>n=79</i>	<i>n=34</i>	<i>n=13</i>	<i>n=20</i>
						<i>n=192</i>

Note: (a) Total includes 14 graduates classified to 'Other subjects'

Notes:

Types of skill mentioned by line managers when asked about skills lacked by graduates when they started their current jobs

01 - Real world skills, practical experience, putting theories into practice, applying theoretical knowledge to real situations, 'knowledge you can't get at university';

02 - Product knowledge/technical knowledge;

03 - Programming/It skills (including skills in particular programming languages or software packages);

Notes to Table 7.1 (continued):

04 - Communication skills – in general, or specific (e.g. written communication skills, writing letters, verbal communication, telephone skills);

05 - Dealing with colleagues (include management skills, teamwork skills, dealing with more senior staff);

06 - Dealing with clients, responding/being sensitive to clients' needs;

07 - Working in this particular organisation, ways of doing things which are specific/local to the organisation;

08 - Other skills/knowledge - e.g. office skills, manual skills, marketing, problem-solving, legal knowledge, knowledge of the particular industry (not specified further);

09 - Confidence (in general, or in using skills in general, not confidence in doing any of the more specific things mentioned at other codes).

Other findings included the following points of interest:

1. Some of our designated employability skills featured strongly in the lists of skill deficiencies when graduates started their current jobs. However, certain employability skills appear to have been hardly mentioned at all, e.g. team-working, presentation skills and numeracy. One preliminary conclusion is that perhaps the survey findings shown in Table 8.1 should be accepted at face value: a large proportion of graduates may be rated by line managers as lacking some required skills when they start work but the 'missing' skills are just as likely to be technical and/or employer-specific in nature as they are to be transferable employability skills.

2. In view of the importance line managers attached to relevant work experience as a recruitment criterion, it might have been expected that students lacking such experience would be disproportionately cited as lacking required skills and knowledge when they started their jobs. However, this was not the case; the proportion of graduates deemed by their managers to have 'all or most' of the necessary skills did not differ greatly between graduates reporting relevant work experience and those who did not.¹ Specific mention of lack of 'real world skills/ practical experience' was only made by 13% of all line managers reporting skill gaps of any kind.

3. A large proportion of the initial skill deficiencies identified by employers relate to areas of skill and knowledge which are best acquired (or can only be acquired) *after* starting employment rather than beforehand, for example, product knowledge and the skills needed for 'working in this particular organisation'. Hence, the question arises as to how much responsibility the graduates' employers took for the development of these skills through provision of training.

7.2 Employer-provided training

In public discussion of the need for graduates to be equipped with employability skills, reference is often made to the alleged preferences of many employers for graduates who will be ‘effective on Day One’ or be able ‘to hit the ground running’. Such high expectations are partly attributed to increased competitive pressures to improve efficiency and cut costs in many industries. ‘Delaying’ – a shift to flatter management structures – in many organisations also seems to have reduced the availability of middle-level staff for supervising and training newly-recruited graduates (Mason, 1999).

In this context it is interesting that our survey of line managers found a wide diversity of expectations about graduate ‘work-readiness’. Some 18% of them ‘agreed strongly’ with a statement that:

‘We need graduates to have the skills and knowledge required to do the job as soon as they arrive’.

Another 43% said they agreed with this statement ‘to some extent’ while a large minority (38%) flatly ‘disagreed’.

The proportion disagreeing ranged from 50% for managers of biological sciences graduates down to 23% for the small number of managers of design graduates (Table 7.2). To some extent this was mirrored in the responses to another question about the time normally required before new graduate employees could work without detailed supervision. In total some 39% of managers said three months or less, 43% said between 3-12 months and 17% said 12 months or more (Table 7.3). For biology graduates the figures were 25%, 50% and 25% respectively. Computer science and business studies graduates were also expected to need above average lengths of time before they could work independently.

As might be expected, the managers’ responses on these issues correlated to some extent with the occupation of graduates, with biology and computing graduates heavily concentrated in professional occupations while roughly half of business graduates were in associate professional jobs (as shown earlier in Table 4.2). Thus, for example, almost two thirds of

¹ Some 31% of graduates reporting ‘relevant work experience’ were deemed to have ‘all or most’ of the necessary skills and knowledge when they started in their current job; the equivalent proportion for graduates lacking such prior work experience was 28%.

graduates in occupations below associate professional level were expected to work without detailed supervision within three months, considerably less time than that allowed to graduates in professional occupations (24%) and those classified to associate professional (38%) and managerial categories (42%) (Table 7.3, Part B).

Table 7.2: Line managers' expectations about 'work-readiness' of graduates, analysed by subject area and occupational group

J5 Thinking about your organisation's experience of employing graduates in the type of position held by (graduate), please say for each of the following statements whether you agree strongly, agree to some extent or disagree.

'We need graduates to have the skills and knowledge required to do the job as soon as they arrive'.

A. Analysed by subject area

	Biological sciences	Business studies	Computer studies	Design studies	History	TOTAL (a)
Agree strongly	13	18	21	31	10	18
Agree to some extent	38	42	41	46	60	43
Disagree	50	39	38	23	30	38
Don't know / No information	0	1	0	0	0	1
TOTAL	100	100	100	100	100	100
	<i>n=32</i>	<i>n=79</i>	<i>n=34</i>	<i>n=13</i>	<i>N=20</i>	<i>n=192</i>

Note: (a) Total includes 14 graduates classified to 'Other subjects'

B. Analysed by occupational group

	Managers and senior officials	Professional occupations	Associate professional occupations	Other occupations	TOTAL (b)
Agree strongly	26	17	15	21	18
Agree to some extent	47	48	39	42	43
Disagree	26	35	44	37	38
Don't know / No information	0	0	1	0	1
TOTAL	100	100	100	100	100
	<i>n=19</i>	<i>n=63</i>	<i>n=72</i>	<i>n=19</i>	<i>n=173</i>

Note: (b) Total excludes 19 graduates whose occupational group could not be established.

Table 7.3: Line managers' expectations about time needed by graduates before they can work without supervision, analysed by subject area and occupational group

J6 Thinking of the type of job done by (graduate), how long do you normally expect it to be before a graduate can work without detailed supervision?

A: Analysed by subject group

	Biological sciences	Business studies	Computer studies	Design studies	History	TOTAL (a)
Less than 1 week	3	4	0	0	0	3
1 week, less than 1 month	6	8	9	8	20	10
1 month, less than 3 months	16	25	21	38	25	26
3 months, less than 12 months	50	42	68	31	20	43
12 months or more	25	20	0	23	30	17
Don't know / No information	0	1	3	0	5	2
TOTAL	100	100	100	100	100	100
	n=32	n=79	n=34	n=13	n=20	n=192

Note: (a) Total includes 14 graduates classified to 'Other subjects'

B. Analysed by occupational group

	Managers and senior officials	Professional occupations	Associate professional occupations	Other occupations	TOTAL (b)
Less than 1 week	0	3	1	11	3
1 week, less than 1 month	5	5	8	26	9
1 month, less than 3 months	37	16	29	26	25
3 months, less than 12 months	37	59	42	32	46
12 months or more	21	14	18	5	16
Don't know / No information	0	3	1	0	2
TOTAL	100	100	100	100	100
	n=19	n=63	n=72	n=19	n=173

Note: (b) Total excludes 19 graduates whose occupational group could not be established.

Taken together, these responses suggest that a majority of line managers expected to devote at least some time and resources to enhancing the skills and competences which graduates had developed at university. This was confirmed in the survey findings on the incidence of employer-provided training.

As many as 88% of graduates reported that they had received formal training (defined as 'organised or structured training') since starting work with their current employer; this figure excludes the 5% of graduates whose only formal training had been initial induction training (see Table 8.5). Two-thirds of graduates said they had received formal *on*-the-job training in the last 12 months: 30% said this had lasted between 1 week and 1 month and 18% said it had lasted for more than a month. The figures were slightly lower for formal *off*-the-job training

in the last 12 months which was reported by 59% of graduates; this off-the-job training had lasted between 1 week and 1 month for 27% of graduates and for more than 1 month for 16%.

As might be expected, the incidence of both types of training was greater, the more recently graduates had started in their present jobs. For example, according to graduates' responses to training questions, structured on-the-job training was provided for 72% of graduates who had started a new job in the 12 months prior to the survey, compared with 62% of graduates who had been in their current job for 12-24 months and only 50% of those who had been in their current jobs for two years or more (Table 7.4). In the case of formal off-the-job training, there is a similar pattern but with narrower gaps between graduates who had recently been appointed to a new position (61% receiving off-the-job training) and those who had been in their present jobs for two years or more (50%).

Table 7.4: Volumes of formal training received by graduates in previous 12 months, analysed by date of starting in present job

Amount of formal ON-the-job training in last 12 months (or since started job, for those in first year of employment):

	Period started in present job: Before July 1999	July 1999- June 2000	From July 2000	TOTAL (a)
Amount of on-the-job training:	<i>% of graduates</i>			
Less than one week	6	10	24	20
1 week - 1 month	19	35	30	30
1 month - 6 months	19	13	12	13
6 months or more	6	5	5	5
No training received	50	38	28	32
<i>TOTAL</i>	100	100	100	100
	<i>N=16</i>	<i>n=40</i>	<i>n=135</i>	<i>n=192</i>

Amount of formal OFF-the-job training in last 12 months (or since started job, for those in first year of employment):

	Period started in present job: Before July 1999	July 1999- June 2000	From July 2000	TOTAL (a)
Amount of off-the-job training:	<i>% of graduates</i>			
Less than one week	13	23	17	18
1 week - 1 month	31	18	29	27
1 month - 6 months	6	15	14	14
6 months or more	0	3	1	2
No training received	50	42	39	41
<i>TOTAL</i>	100	100	100	100
	<i>N=16</i>	<i>n=40</i>	<i>n=135</i>	<i>n=192</i>

Table 7.5: Graduates' responses to questions about employer-provided training since joined current employer

GRADUATES' TRAINING QUESTIONS		Biological sciences	Business studies	Computer studies	Design studies	History	TOTAL (a)
Formal' = organised or structured training, either on or off the job							
E10	% of graduates receiving formal training from current employer:						
	Initial induction training	81	85	91	54	90	84
	Specific training for work in department	84	75	71	54	55	72
	Technical / IT training	56	56	71	62	60	59
	Presentation /communication skills training	25	38	29	15	55	34
	Other types of formal training	44	57	38	23	60	49
E11	At least one of above types of training	94	94	94	69	95	93
	At least one of above types of training (but excluding induction training)	94	86	91	69	85	88
E12	% of graduates receiving formal ON-the-job training since starting with current employer	75	72	74	54	45	68
E13	Amount of formal ON-the-job training in last 12 months (or since started job, for those in first year of employment):						
		<i>% of all graduates</i>					
	Less than one week	22	23	15	8	15	20
	1 week - 1 month	28	29	35	38	25	30
	1 month - 6 months	19	11	24	0	5	13
	6 months or more	6	9	0	8	0	5
	No formal on-the-job training received in last 12 months	25	28	26	46	55	32
	TOTAL	100	100	100	100	100	100
E14	Importance of formal ON-the-job training in developing skills and knowledge used in current job						
	Very important	59	46	47	38	25	44
	Quite important	13	20	12	15	15	17
	Not very important	3	5	9	0	5	5
	Not at all important	0	1	3	0	0	1
	No formal on-the-job training received in last 12 months	25	28	29	46	55	33
	TOTAL	100	100	100	100	100	100
E15	% of graduates receiving formal OFF-the-job training since starting with current employer	50	63	62	46	65	59
E16	Amount of formal OFF-the-job training in last 12 months (or since started job, for those in first year of employment):						
	Less than one week	25	20	18	8	15	18
	1 week - 1 month	16	30	32	31	20	27
	1 month - 6 months	9	11	12	8	25	14
	6 months or more	0	1	0	0	5	2
	No formal off-the-job training received in last 12 months	50	37	38	54	35	41
	TOTAL	100	100	100	100	100	100
		<i>n=32</i>	<i>n=79</i>	<i>n=34</i>	<i>n=13</i>	<i>n=20</i>	<i>n=192</i>

Note: (a) Total includes 14 graduates classified to 'Other subjects'

**Table 7.5: (continued)
Graduates' responses to questions about employer-provided training since joined current employer**

E17	Importance of formal OFF-the-job training in developing skills and knowledge used in current job						
	Very important	13	37	24	31	35	29
	Quite important	31	20	29	8	15	23
	Not very important	6	6	6	8	10	6
	Not at all important	0	0	3	0	5	1
	No formal off-the-job training received in last 12 months	50	37	38	54	35	41
	<i>TOTAL</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
E18	% of graduates who have done work experience in other departments since joining organization	28	27	18	15	20	23
		<i>n=32</i>	<i>n=79</i>	<i>n=34</i>	<i>n=13</i>	<i>n=20</i>	<i>n=192</i>

Note: (a) Total includes 14 graduates classified to 'Other subjects'

Table 7.6: Line managers' responses to questions about training provided to graduates

LINE MANAGERS' TRAINING QUESTIONS		Biological sciences	Business studies	Computer studies	Design studies	History	TOTAL (a)
L3	% saying graduates have had job-related training of some kind since started present job	94	89	91	77	100	90
L4	% of graduates who have had different types of training since started present job:						
	Further university course or study programme	9	16	6	15	5	13
	Work towards professional qualification	19	39	26	8	55	32
	Formal ON-the-job training	91	81	88	77	80	83
	Formal OFF-the-job training	66	73	76	46	85	70
L5-L6	% of graduates receiving training since starting job to develop:						
	Computing and IT skills	69	56	76	77	70	65
	Other practical or technical skills	78	58	50	62	60	60
	Specialist subject knowledge	72	73	65	54	85	70
	Written communication skills	13	18	21	23	35	20
	Verbal communication skills	38	44	35	15	45	39
	Numerical ability	9	11	9	8	15	11
	Problem solving ability	22	43	35	15	40	34
	Ability to work in a team	44	48	32	31	65	45
	Ability to manage the work of others	9	25	9	8	25	17
	Ability to manage resources	25	34	21	31	35	31
	Ability to work in different parts of his/her company	53	39	32	38	40	39
	Ability to relate to customers	41	54	32	38	60	47
	Ability to influence other people	34	48	35	15	55	42
	Ability to listen to other people	38	49	38	38	50	44
		<i>n=32</i>	<i>n=79</i>	<i>n=34</i>	<i>n=13</i>	<i>n=20</i>	<i>n=192</i>

Note: (a) Total includes 14 graduates classified to 'Other subjects'

Overall, just over half (51%) of all graduates in the sample had started work with their present employer since July 2000 but another 20% had taken up a new position with their existing employer in that time period. This degree of movement is typical of graduates' early years in employment and clearly accounts for a very large proportion of all training provided by employers, especially formal *on*-the-job training. Formal off-the-job training provision is more likely to persist after graduates have become more established in particular positions.

Some 44% of graduates described receiving on-the-job training which had been 'very important' in helping to develop the skills and knowledge needed in their jobs and 17% said it had been 'quite important'. In the case of off-the-job training the equivalent proportions were 29% and 23% respectively. The remainder in each case had not received any such training in the previous 12 months or did not rate it as useful.

Since as many as seven out of ten graduates were initially assessed by line managers as having only some or none of the skills required for their current jobs (see Table 7.1 above) we checked the extent to which those employers had sought to rectify the problems by providing training for the graduates concerned. There is some evidence of this in graduates' responses to questions about training provision, particularly in the case of formal off-the-job training where graduates initially lacking in skills were significantly more likely to report receiving training than graduates deemed to possess all or most of the required skills (Table 7.7). However, curiously, line managers' responses to training questions show very little difference in training given to graduates possessing all/most or and those possessing some/none of the skills required in their current jobs. Note also that the incidence of training reported by line managers (since graduates started their present jobs) typically exceeds the training incidence reported by graduates even since they started work with their current employer.

Given the limited extent to which employability skills featured in the lists of skills said to be lacking by many graduates, it comes as no surprise that most employability skills ranked below technical and practical skills in respect of the *content* of employer-provided training. For example, only a third of graduates said they had received formal training in presentation/communication skills compared to 72% who had received training geared to the specific demands of their department and 59% who reported technical/IT training of some kind (Table 7.5, Question E10). This order of priority was confirmed by line managers, 60-70% of whom said graduates had been given training designed to develop specialist subject

knowledge, computing/IT and other technical and practical skills (Table 8.6, Questions L5-L6).

Computing/IT training had been given to more than half of graduates in all five subject areas, not just graduates in computer science, so this is clearly an important area of generic skills for many employers. Apart from IT skills, the highest-ranking employability skills in terms of training provision, according to line managers, were customer-facing skills (training given to 47% of graduates), team-working skills (45%) and inter-personal skills of different kinds, for example, ‘listening to other people’ (44%) and ‘influencing other people’ (42%).

Table 7.7: Employer-provided training received by graduates, analysed by initial assessment of graduate skill levels made by line managers

	Graduate said to possess all or most required skills	Graduate said to possess only some or none of required skills	F-test for equality of respective means (P-values)
<i>% of graduates in each category</i>			
Formal ON-the-job training provided since graduate started with present employer?			
Graduates' responses:			
YES	59	71	0.1073
NO	41	29	
Formal ON-the-job training provided since graduate started present job?			
Line managers' responses:			
YES	81	83	0.7465
NO	18	17	
Formal OFF-the-job training provided since graduate started with present employer?			
Graduates' responses:			
YES	48	63	0.0592*
NO	51	37	
Formal OFF-the-job training provided since graduate started present job?			
Line managers' responses:			
YES	69	70	0.8508
NO	31	30	
	<i>n=54</i>	<i>n=133</i>	

*: statistically significant at 94% level of confidence

Taken together our findings on initial skill assessments and employer-provided training have several implications for the main issue at the heart of this project; namely, the extent to which universities have succeeded in equipping newly-qualified graduates with employability skills.

Firstly, only a small minority of graduates in our sample appear to have fallen short of line managers' requirements in terms of employability skills when they first started in their current jobs.

Secondly, the patterns of training provision by employers in the sample suggest that, with the exception of IT skills development, efforts to improve generic employability skills come second to the time and resources devoted to technical, practical and job-specific skills training.

In short, there is little evidence from this sample of severe gaps in graduates' employability skills or, to be more specific, of universities failing to meet employers' expectations in respect of graduate employability skills. However, as discussed in Chapter 4, there is a strong likelihood that this sample of graduates is above average in terms of the matches between graduates' and line managers' expectations. Hence, some caution needs to be attached to these findings. And even with the present sample the question remains as to whether any positive evidence can be identified relating to the *success* of universities' efforts to enhance employability skills. In our penultimate chapter we address this question head-on by considering the determinants of several different indicators of graduate performance in employment.

Chapter 8: Employability Skills and Graduate Job Performance and Career Progress: Multivariate Analysis

8.1 Overview

In Chapter 3 we attempted to gauge the impact of employability skills-enhancing activities in universities on two measures of initial labour market performance; namely, the probability of graduates finding employment six months after graduation and the probability of them being employed in a ‘graduate-level’ occupation at that time. In that analysis we were able to distinguish between three different kinds of employability skills development at department level:

- The priority given to employability skills in teaching, learning and assessment;
- Student participation in work experience during their courses;
- Employer involvement in course design and delivery.

The results suggested that, in respect of these initial labour market outcomes for graduates, structured work experience had highly positive effects. In addition, our measure of employer involvement in courses was positively associated with the probability of graduates being employed in a graduate-level occupation. However, there was no evidence of a significant independent effect of university departments’ efforts to develop employability skills through the teaching, learning and assessment of employability skills.

In order to learn more about the complex relationships between universities’ efforts to enhance employability skills and graduate labour market performance, we now make use of data from the survey of paired graduates and line managers which enabled us to develop performance measures that go beyond employment status only six months after graduation. These new measures relate to skills utilisation, initial skill levels, graduate performance in their jobs and indicators of graduate career progress:

- Graduates’ assessments of the extent to which their degree-level skills and knowledge were utilised in employment (D11);
- Managers’ assessments of the skills and knowledge that graduates had when they started in their current jobs (L1);
- Managers’ assessments of the career progress which graduates were likely to make in the next three years (M3);

- Whether or not graduates had received a significant increase in responsibilities accompanied by a pay increase (C17, C19);
- Graduates' current salaries (E19-E22).

In order to increase the chances of graduates and line managers agreeing to interviews, prospective interviewees were assured that the managers would not be asked questions about how well graduates were performing in their jobs. Instead, we have taken managers' expectations of career progress along with data on promotion accompanied by increased pay as indirect indicators of how graduate job performance has been evaluated by their employers.

In the analysis that follows, these performance indicators are first related to a range of prospective determinants and control variables such as gender, age, job tenure, A-level points (as a proxy for intellectual ability), type of university attended, degree class, possession of postgraduate qualifications, private vs. public sector employment and dummy variables for degree subject, sector of employment, occupation group and size of establishment (see Tables 8.1 and 8.2 for descriptions and summary statistics of these variables). In subsequent regressions, the summary variables relating to employability skills development (as derived in Chapter 6) are entered in varying combinations in order to assess the extent and nature of their effects (if any) on the respective dependent variables. To recapitulate, these summary variables were designed to capture graduates' responses to questions about:

- The time spent in university on employability skills-related activities (D6F1);
- The degree of emphasis by university teaching staff on employability skills (D7F1);
- The extent to which graduates believed their university course had helped them to develop various kinds of employability skills (D9F4-7).

Table 8.1: Descriptions of dependent and independent variables used in regression analyses

DEPENDENT VARIABLES

dskutil	=1 if graduate reports that his/her skills and knowledge are 'about right' or 'too low' for the job he/she is doing
dlacksk	=1 if line manager assesses graduate as possessing all or most necessary skills when started in current job
dfuture	=1 if line manager believes graduate will be in much more senior position in three years time
dincrsp	=1 if graduate has had significant increase in responsibilities since joined current employer, accompanied by pay increase
ln salary	log of current annual gross salary

Table 8.1 (continued): Descriptions of dependent and independent variables used in regression analyses

INDEPENDENT VARIABLES

Graduate characteristics:

male	
age	
age2	Age squared
jobten	No. of years since started work with current employer
startsal	Starting salary with current employer
alevel	Total A-level points
dnonalev	=1 if did not take A-levels
olduniv	=1 if attended pre-1992 University
degclass	=1 if received First or Upper Second honours degree
postgrad	=1 if holds postgraduate qualifications
private	=1 if employed in private sector
sandwich	=1 if graduate had work experience as part of degree studies for six months or more

Degree subject dummies:

biology	Biological sciences
business	Business studies
compstudies	Computer science / studies
design	Design studies
history	History

Reference category: Other subjects

Occupational group dummies:

manager	Managers and senior officials
professional	Professional occupations
assocprof	Associate professional occupations

Reference category: Other occupations

Establishment size-group dummies:

25-99	25-99 employees
100-499	100-499 employees
500plus	500-plus employees

Reference category: Establishments with fewer than 25 employees

Industry dummies:

busserv	Business services (excluding computer services)
compserv	Computer services
othserv	Other service industries
manufg	Manufacturing

Reference category: Other industries

Ingtime	=1 if less than three months required for newly-recruited graduates to meet job requirements without detailed supervision; =2 if learning time ranges from 3 months up to 12 months; =3 if more than 12 months learning time
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EMPLOYABILITY SKILLS SUMMARY VARIABLES

d6f1	Time spent in university on employability skills-related activities
d7f1	University teaching staff emphasis on employability skills
d9f4	Development of presentation, verbal and team-working skills helped by university studies
d9f5	Development of IT, numeracy and problem-solving skills helped by university studies
d9f6	Development of 'external interaction' skills helped by university studies
d9f7	Development of information processing and written communication skills helped by university studies

Table 8.2: Summary statistics of variables used in regression analyses

Variable	Obs	Mean	Std. Dev.	Min	Max
<u>Independent variables:</u>					
male	192	0.46	0.50	0	1
age	192	25.7	4.5	21	54
age2	192	682.3	301.8	441	2916
alevel1	192	20.7	9.1	2	50
dnonalev	192	0.16	0.36	0	1
jobten	192	2.04	1.59	0.5	19.5
olduniv	192	0.40	0.49	0	1
degclass	192	0.71	0.45	0	1
postgrad	192	0.19	0.39	0	1
biology	192	0.17	0.37	0	1
business	192	0.41	0.49	0	1
compstudies	192	0.18	0.38	0	1
design	192	0.07	0.25	0	1
history	192	0.10	0.31	0	1
busserv	192	0.27	0.43	0	1
compserv	192	0.17	0.36	0	1
othserv	192	0.33	0.45	0	1
manufg	192	0.17	0.36	0	1
manager	192	0.11	0.30	0	1
professional	192	0.36	0.46	0	1
assocprof	192	0.42	0.48	0	1
25-99	192	0.24	0.43	0	1
100-499	192	0.26	0.44	0	1
500-plus	192	0.22	0.41	0	1
private	192	0.82	0.39	0	1
sandwich	192	0.32	0.47	0	1
lngthime	192	1.79	0.72	1	3
startsal	192	15945	4685	8000	37500
d6f1	192	0.01	1.00	-3.07	1.41
d7f1	187	-0.02	1.00	-2.50	1.89
d9f4	192	0.05	0.97	-3.31	1.40
d9f5	192	0.04	0.97	-3.38	1.64
d9f6	192	0.03	0.98	-2.13	2.50
d9f7	192	0.03	0.95	-3.34	1.73
<u>Dependent variables:</u>					
salary	192	19708	6475	8000	45000
dskutil	192	0.78	0.41	0	1
dlacksk	187	0.29	0.45	0	1
dfuture	191	0.36	0.48	0	1
dincrsp	191	0.46	0.50	0	1

8.2 Graduates' assessments of skills utilisation in their current jobs

As described in Section 6.1, about one in five sample graduates reported that their skills and knowledge were 'too high' for the jobs they were doing. As in the wider population of graduates, a large majority (72%) regarded their skills and knowledge as 'about right' for the jobs they were doing. A small minority (6%) said their skills and knowledge were 'too low'. Table 9.4 shows the results of a logistic regression analysis where the dependent variable was defined as equal to 1 if the graduate reported that his/her skills and knowledge were 'about right' or 'too low' for the job he/she was doing. In the baseline specification, focusing on individual characteristics, the coefficient on age of graduates is negative and highly statistically significant. The negative sign is perhaps surprising given the evidence referred to in Section 6.1 that skills under-utilisation tends to decline as graduates become better-established in the labour market. We discuss below a possible reason for the negative association between age and under-utilisation of skills in the present sample of graduates. Apart from two subject dummies – biology and business studies – which are negatively-signed (relative to the reference category 'other subjects') and weakly significant, none of the other variables are statistically significant, including the 'sandwich' indicator of participation in structured work experience prior to employment and the variable signifying attendance at an Old University.

Since both the sandwich and Old University variables are strongly correlated with some of the summary measures of employability skills development (Table 8.3), they are omitted from subsequent specifications which seek to identify the effects of introducing the employability skills measures as independent variables. Equations 2 and 3 in Table 8.4 show that the two variables relating to time spent on employability skills-related activities in university (D6F1) and emphasis on those skills by university staff (D7F1) do not add to the explanatory power of the model and their coefficients are very poorly-defined.

Table 8.3 Correlations between sandwich, Old University and employability skills summary variables

	sandwich	olduniv	d6f1	d7f1	D9f4	d9f5	d9f6	d9f7
Sandwich	1							
Olduniv	-0.21	1						
d6f1	0.22	-0.47	1					
d7f1	0.38	-0.41	0.60	1				
d9f4	0.01	-0.33	0.49	0.41	1			
d9f5	0.10	-0.08	0.22	0.25	0.02	1		
d9f6	0.23	-0.24	0.38	0.47	0.20	0.18	1	
d9f7	-0.05	0.14	-0.19	-0.03	0.00	-0.11	0.08	1

The same is true in Equation 4 of three of the four variables based on graduates' evaluations of how much their university course had helped them to develop various kinds of employability skills. However, the exception D9F5 – referring to IT, numeracy and problem-solving skills – is negatively-signed and significant at a 96% level of confidence. This finding survives in alternative specifications such as that shown in Equation 5. A possible explanation for why some graduates may feel that their IT-related skills are under-utilised emerges from consideration of their responses to questions about computer usage in their jobs (discussed in Chapter 6). Table 8.5 shows that those reporting the usage of computers for only simple or moderate tasks (such as word processing) are more likely to report under-utilisation of skills than are those using computers for more complex tasks. This appears to apply particularly to graduates in subjects like biology and business studies² and suggests that – in this area of employability skills at least – some graduates are 'over-qualified' relative to the skill needs of their current jobs. Since the sample includes a relatively large share of graduates who are still with their initial main employer, we conjecture that the negative association between age and reported under-utilisation of skills (as noted above) reflects frustration among some graduates as the IT skills component of their jobs becomes increasingly more 'routine' over time.

Table 8.5: Relationship between tasks done by computer in current job and graduates' responses to question on skills utilisation

	Nature of tasks done by computer in current job (a):				TOTAL (b)
	Very complex	Complex	Moderate	Simple	
<i>Response to question:</i>					
<i>Do you think your level of skills and knowledge is....</i>	<i>% of graduates</i>				
Too low for the job you're doing	11	2	8	0	6
About right	71	86	69	25	72
Too high	18	12	23	75	22
TOTAL	100	100	100	100	100
	<i>n=28</i>	<i>n=50</i>	<i>n=104</i>	<i>n=8</i>	<i>n=190</i>

Pearson $\chi^2(8)=20.9$, P-value=0.007

Notes:

(a) Examples of tasks: Very complex = advanced programming; Complex = data analysis, product design; Moderate = word processing

(b) Excludes two respondents who did not use computers in their current jobs.

² Chi-square statistics for subject-specific tables equivalent to Table 9.5 have the following p-values: biological sciences 0.003, business studies 0.077, computer studies 0.119, design 0.096 and history 0.891.

Table 8.4 Logistic regressions using graduates' assessments of skills utilisation in their current jobs as dependent variable

Dependent variable: dskutil =1 if graduate reports that his/her skills and knowledge are 'about right' or 'too low' for the job he/she is doing

	1. Base specification			2. Drop olduniv and sandwich variables, add d6f1			3. Replace d6f1 with d7f1			4. Replace d7f1 with d9f4-d9f7			5. Alternative specification, retain d9f4 and d9f5		
Independent variables	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.
male	0.75	-0.29	0.40	0.74	-0.30	0.40	0.77	-0.26	0.40	0.79	-0.24	0.42	0.76	-0.27	0.42
age	0.86	-0.15	0.05 ***	0.86	-0.15	0.05 ***	0.85	-0.17	0.05 ***	0.86	-0.16	0.05 ***	0.86	-0.15	0.05 ***
alevel	0.98	-0.02	0.03	1.00	0.00	0.03	0.99	-0.01	0.03	0.99	-0.01	0.03			
dnonalev	1.17	0.16	0.56	1.00	0.00	0.54	0.98	-0.02	0.54	0.85	-0.16	0.55			
jobten	0.93	-0.08	0.15	0.91	-0.09	0.15	0.94	-0.07	0.15	0.93	-0.07	0.14	0.92	-0.09	0.14
olduniv	2.32	0.84	0.60												
degclass	2.02	0.70	0.48	2.05	0.72	0.44	2.48	0.91	0.46 **	2.03	0.71	0.45	2.07	0.73	0.42 *
postgrad	2.45	0.90	0.66	2.90	1.06	0.65	2.97	1.09	0.68	2.78	1.02	0.67	2.86	1.05	0.62 *
biology	0.06	-2.86	1.65 *	0.07	-2.67	1.61 *	0.07	-2.73	1.58 *	0.09	-2.36	1.62	0.09	-2.42	1.61
business	0.07	-2.70	1.60 *	0.07	-2.62	1.56 *	0.07	-2.60	1.53 *	0.08	-2.56	1.52 *	0.08	-2.53	1.51
compstudies	0.10	-2.32	1.63	0.11	-2.19	1.58	0.15	-1.91	1.55	0.16	-1.86	1.59	0.14	-1.96	1.56
design	0.14	-1.99	1.74	0.13	-2.07	1.73	0.13	-2.05	1.72	0.12	-2.10	1.72	0.12	-2.11	1.68
history	0.11	-2.20	1.67	0.14	-1.99	1.65	0.14	-1.98	1.61	0.10	-2.28	1.61	0.10	-2.33	1.62
sandwich	0.90	-0.10	0.47												
d6f1				0.85	-0.17	0.26									
d7f1							0.76	-0.27	0.24						
d9f4										0.76	-0.27	0.24	0.78	-0.25	0.24
d9f5										0.55	-0.60	0.28 **	0.58	-0.54	0.26 **
d9f6										1.12	0.11	0.23			
d9f7										1.05	0.05	0.23			
constant		7.37	2.44 ***		7.19	2.41 ***		7.57	2.44 ***		7.50	2.45 ***		7.35	2.21 ***
Number of obs =	192			192			187			192			192		
chi2(14) =	28.66			26.65			27.26			32.88			32.44		
Log Likelihood =	-86.5			-87.5			-84.7			-84.4			-84.6		

***Statistically significant at 1% level or better

**5% level

*10% level

8.3 Managers' assessments of graduates' initial skill endowments

Recall that when asked about the skills and knowledge that individual graduates had when they started their current jobs, only 28% of line managers said that graduates had 'all or most' of the necessary skills and knowledge. Just under two-thirds said the graduates had 'some' of the required skills while 4% said they had 'none of them' (Section 8.1).

In this case the dependent variable was defined as equal to 1 if graduates were said to have all or most of the necessary skills at the outset of their current jobs. The results show a negative and statistically significant (94%) association between the probability of graduates possessing all or most of the skills required at the start of their jobs and the initial learning time (involving on-the-job training and experience) which managers expected graduates to need before they could work without detailed supervision. This is highly plausible in that the shorter the time needed to learn to do a job without supervision; the less likely it is that newly-recruited graduates will be perceived as lacking the necessary skills. At the same time, the positive and significant coefficients on the higher-level occupational variables (managers and professionals) may reflect the efforts made by employers to check that graduates do possess the required skills and knowledge for those jobs before they are appointed.

However, the analysis as a whole is disappointing with very little statistical significance to be attached to the model as a whole, and this did not change when employability skills variables were introduced into the model (results not shown). Given this lack of explanatory power we do not give this model any further consideration. However, in view of the issues raised in Chapter 8 about the potential effects of work experience on graduate work-readiness, it is notable that the coefficient on the sandwich variable in Table 9.6, Equation 1 is not statistically significant. This appears to support the observation made in Section 8.1 that a large proportion of the initial skill deficiencies cited by employers referred to areas of skill and knowledge which are best acquired (or can only be acquired) *after* starting employment rather than beforehand, for example, product knowledge and the skills needed for 'working in this particular organisation'.

Table 8.6: Logistic regression using managers' assessments of graduates' initial skill endowments as dependent variable

Dependent variable: dskutil =1 if graduates were said to have all or most of the necessary skills at the start of their current jobs

1. Base specification

Independent variables	Odds ratio	Coef.	Std. Err.	
-----+	-----	-----	-----	
male	0.97	-0.03	0.40	
age	1.02	0.02	0.05	
alevel	1.02	0.02	0.03	
dnonalev	0.94	-0.06	0.54	
jobten	0.68	-0.39	0.22	*
olduniv	0.92	-0.08	0.53	
degclass	0.63	-0.46	0.47	
postgrad	0.52	-0.65	0.60	
biology	0.94	-0.06	0.81	
business	0.73	-0.32	0.73	
compstudies	0.45	-0.79	0.91	
design	2.49	0.91	1.05	
history	0.68	-0.39	0.90	
busserv	1.09	0.08	0.85	
compserv	1.05	0.05	0.98	
othserv	1.28	0.25	0.83	
manufg	1.27	0.24	0.94	
manager	8.73	2.17	1.03	**
professional	7.83	2.06	0.95	**
assocprof	5.05	1.62	0.92	*
25-99	0.60	-0.52	0.54	
100-499	0.64	-0.44	0.52	
500plus	0.78	-0.24	0.57	
private	0.74	-0.30	0.52	
sandwich	0.89	-0.12	0.45	
lngtime	0.57	-0.55	0.28	*
constant		-0.76	1.99	

Number of obs = 187

chi2(26) = 24.54

Log Likelihood = -100.1

***Statistically significant at 1% level or better

**5% level

*10% level

8.4 Line managers' expectations of graduate career progress

As an indirect way of soliciting managers' assessments of graduates' capabilities, line managers were asked the following question:

Please think about the progress you think [name of graduate] will make over the next three years, whether s/he stays with your organisation or moves elsewhere. Three years from now do you think that s/he will be... (1) in a much more senior position; (2) in a slightly more senior position; or (3) doing much the same level of work as now?

Just over a third of managers said that the graduates concerned would be in a 'much more senior' position while 56% replied 'in a slightly more senior position'. For purposes of analysis we defined a dummy variable equal to one for 'much more senior' responses and the correlates of this response were then explored in the same way as for previous dependent variables.

As expected, our initial baseline regression showed the probability of a very positive assessment of graduates' career prospects to be positively and significantly related to age and to graduates' existing positions in high-status occupational groups such as managers (Table 8.7, Equation 1). Equations 2-4 in Table 8.7 show the results of entering the employability skills variables into the regressions after dropping the sandwich and Old University variables (which were insignificant in Equation 1) but continuing to control for other effects related to degree subject, industry, size of establishment, etc. In Equation 2 the coefficient on D6F1 – summarizing the time spent by graduates in employability skills-enhancing activities is relatively large, positive and modestly significant (93%) and this result survives a much more restricted specification (Equation 5). However, the coefficients on the other five employability skills variables in Equations 3 and 4 are not significant (although four of them are positively-signed).

Before drawing any further conclusions from these findings we go on to assess the determinants of two other indicators of graduate job performance:

- The incidence of promotion accompanied by a pay increase;
- Current salary levels.

Table 8.7: Logistic regressions using managers' expectations of graduate career progress as dependent variable

Dependent variable: dfuture =1 if line manager believes graduate will be in much more senior position in three years time (Logit estimates)

Independent variables	1. Base specification			2. Drop olduniv and sandwich variables, add d6f1			3. Replace d6f1 with d7f1			4. Replace d7f1 with d9f4-d9f7			5. Alternative specification, with d6f1			
	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.	
Male	1.06	0.06	0.40	1.09	0.09	0.40	1.23	0.21	0.41	1.08	0.07	0.41	1.04	0.04	0.38	
age	1.10	0.09	0.05 **	1.10	0.09	0.05 **	1.10	0.10	0.05 **	1.09	0.09	0.05 *	1.07	0.07	0.04 *	
alevel	1.03	0.03	0.03	1.06	0.06	0.03 **	1.06	0.06	0.03 **	1.06	0.06	0.02 **	1.05	0.05	0.02 **	
dnonalev	0.39	-0.94	0.59	0.31	-1.16	0.57 **	0.30	-1.19	0.58 **	0.32	-1.13	0.58 **	0.39	-0.95	0.56 *	
jobten	0.92	-0.08	0.14	0.93	-0.07	0.14	0.95	-0.05	0.13	0.95	-0.05	0.14				
olduniv	1.75	0.56	0.50													
degclass	0.69	-0.37	0.50	0.64	-0.44	0.48	0.57	-0.56	0.50	0.62	-0.48	0.49				
postgrad	0.56	-0.59	0.52	0.59	-0.52	0.52	0.59	-0.52	0.54	0.56	-0.59	0.54				
biology	0.63	-0.46	0.85	0.68	-0.38	0.84	0.75	-0.29	0.83	0.70	-0.35	0.87	0.68	-0.38	0.82	
business	1.12	0.11	0.79	0.75	-0.29	0.76	0.81	-0.21	0.76	0.86	-0.15	0.77	0.73	-0.31	0.74	
compstudies	0.60	-0.51	1.00	0.62	-0.48	0.93	0.56	-0.57	0.95	0.60	-0.52	0.98	0.67	-0.40	0.91	
design	4.11	1.41	1.13	3.12	1.14	1.09	3.42	1.23	1.15	3.17	1.15	1.11	2.83	1.04	1.05	
history	1.31	0.27	0.87	1.75	0.56	0.88	1.71	0.54	0.87	1.82	0.60	0.89	1.77	0.57	0.85	
busserv	2.76	1.02	0.89	2.46	0.90	0.88	3.09	1.13	0.90	3.02	1.11	0.91	2.16	0.77	0.86	
compserv	1.86	0.62	1.07	1.79	0.58	1.02	2.40	0.88	1.05	2.05	0.72	1.05	1.47	0.39	1.02	
othserv	0.45	-0.80	0.93	0.34	-1.08	0.91	0.43	-0.84	0.92	0.42	-0.86	0.93	0.35	-1.04	0.90	
manufg	3.43	1.23	0.96	2.91	1.07	0.94	3.26	1.18	0.96	4.02	1.39	0.98	2.23	0.80	0.91	
manager	14.06	2.64	0.94 ***	12.79	2.55	0.95 ***	13.28	2.59	0.96 ***	12.97	2.56	0.94 ***	13.13	2.57	0.91 ***	
professional	3.27	1.18	0.82	3.12	1.14	0.83	3.50	1.25	0.83	3.11	1.13	0.83	3.06	1.12	0.82	
assocprof	1.92	0.65	0.77	1.87	0.63	0.79	2.20	0.79	0.79	1.96	0.67	0.79	2.05	0.72	0.78	
25-99	0.37	-1.00	0.54 *	0.33	-1.10	0.54 **	0.39	-0.95	0.55 *	0.34	-1.08	0.54 **	0.31	-1.17	0.53 **	
100-499	0.59	-0.52	0.52	0.54	-0.62	0.51	0.52	-0.66	0.52	0.53	-0.63	0.52	0.52	-0.65	0.51	
500plus	0.90	-0.11	0.57	0.87	-0.14	0.57	0.82	-0.20	0.58	0.84	-0.18	0.58	0.82	-0.19	0.55	
private	0.80	-0.22	0.56	0.59	-0.52	0.57	0.60	-0.52	0.57	0.68	-0.38	0.56				
sandwich	0.85	-0.16	0.46													
d6f1				1.53	0.42	0.23 *							1.43	0.35	0.21 *	
d7f1							1.41	0.34	0.22							
d9f4										1.10	0.10	0.21				
d9f5										1.18	0.16	0.22				
d9f6										1.23	0.21	0.21				
d9f7										0.95	-0.05	0.22				
constant		-4.15	1.95 **		-3.83	1.95 **		-4.38	1.96 **		-4.09	1.96 **		0.02	-3.90	1.84 **

Number of obs = 191 chi2(25) = 44.58 Log Likelihood = -102.0	Number of obs = 191 chi2(24) = 46.68 Log Likelihood = -101.0	Number of obs = 186 chi2(24) = 46.01 Log Likelihood = -98.5	Number of obs = 191 chi2(27) = 45.51 Log Likelihood = -101.6	Number of obs = 191 chi2(20) = 43.67 Log Likelihood = -102.5
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8.5 Increases in graduates' responsibilities with accompanying pay increases

As described in Section 5.5, some 69% of sample graduates had been given a significant increase in responsibilities since joining their present organisations, and two-thirds of them (45% of all graduates) had seen this promotion reflected in a pay increase. Logistic regressions showed that – after controlling for a wide range of potential influences including starting salary – a dummy variable defined to equal 1 for all graduates with increased responsibilities and pay was, as might be expected, strongly positively associated with job tenure (Table 8.8, Equation 1).

After again dropping variables which were insignificant in Equation 1 but known to be correlated with our employability skills measures, Equations 2-6 show the coefficients on employability skills variables to be largely insignificant with two partial exceptions:

D6F1 – summarising the time spent as students on employability-related activities (e.g., group projects, oral presentations, 'Key Skills' courses);

D9F6 – a measure of the extent to which students believed they had been helped to acquire 'external interaction' skills during their university studies, e.g. building up networks of professional contacts.

In the case of D6F1, the coefficient was large and positive but insignificant in Equation 2; however, it was better-defined (93% significance level) in a more restricted specification (Equation 5). By contrast, D9F6 was large, negatively-signed and weakly significant (90%) in Equation 4, but even this significance level did not survive in alternative specifications such as Equation 6.

Table 8.8: Logistic regressions using graduates' assumption of increased responsibilities accompanied by pay increase as dependent variable

Dependent variable: dincrsp2 =1 if graduate has had significant increase in responsibilities since joined current employer, accompanied by pay increase

1. Base specification				2. Drop olduniv and sandwich variables, add d6f1			3. Replace d6f1 with d7f1			4. Replace d7f1 with d9f4-d9f7			5. Alternative specification, with d6f1			6. Alternative specification, with d9f6					
Independent variables	Odds ratio	Coef	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef	Std. Err.	Odds ratio	Coef	Std. Err.	Odds ratio	Coef.	Std. Err.	Odds ratio	Coef.	Std. Err.			
male	1.07	0.06	0.39	1.09	0.08	0.39	1.00	0.00	0.39	1.05	0.05	0.40	0.95	-0.05	0.04						
age	0.95	-0.05	0.05	0.95	-0.05	0.05	0.94	-0.06	0.05	0.95	-0.05	0.05				0.96	-0.05	0.04			
alevel	0.99	-0.01	0.03	0.99	-0.01	0.02	0.97	-0.03	0.03	0.98	-0.02	0.02									
dnonalev	1.47	0.38	0.55	1.36	0.31	0.52	1.81	0.59	0.54	1.71	0.54	0.55									
jobten	2.55	0.93	0.23	2.61	0.96	0.24	2.43	0.89	0.24	2.42	0.89	0.24	2.52	0.92	0.23	2.31	0.84	0.22			
olduniv	0.93	-0.08	0.55																		
degclass	1.96	0.67	0.48	1.85	0.62	0.46	2.25	0.81	0.49	2.42	0.88	0.48	1.73	0.55	0.43	2.01	0.70	0.44			
postgrad	0.54	-0.62	0.53	0.53	-0.64	0.54	0.63	-0.46	0.54	0.57	-0.56	0.55									
biology	1.17	0.16	0.84	1.19	0.18	0.83	1.11	0.11	0.81	1.04	0.04	0.87	1.15	0.14	0.81	0.97	-0.03	0.82			
business	1.17	0.16	0.77	1.07	0.07	0.75	1.32	0.28	0.74	1.34	0.29	0.76	1.16	0.15	0.74	1.68	0.52	0.74			
compstudies	0.77	-0.26	0.94	0.78	-0.25	0.92	0.85	-0.16	0.92	0.75	-0.29	0.97	0.87	-0.14	0.90	0.90	-0.11	0.93			
design	0.45	-0.80	1.06	0.47	-0.76	1.05	0.43	-0.85	1.08	0.46	-0.79	1.07	0.56	-0.58	1.03	0.61	-0.50	1.05			
history	1.65	0.50	0.85	1.98	0.68	0.85	1.45	0.37	0.85	1.44	0.36	0.88	1.82	0.60	0.84	1.14	0.13	0.85			
busserv	0.68	-0.38	0.85	0.66	-0.41	0.85	0.74	-0.30	0.85	0.50	-0.70	0.88	0.80	-0.22	0.80	0.79	-0.23	0.83			
compserv	0.72	-0.32	1.00	0.71	-0.34	0.99	0.57	-0.57	1.02	0.62	-0.48	1.03	0.82	-0.20	0.95	0.91	-0.10	1.00			
othserv	0.60	-0.51	0.84	0.53	-0.64	0.84	0.66	-0.42	0.84	0.55	-0.60	0.86	0.63	-0.46	0.80	0.83	-0.19	0.83			
manufg	0.47	-0.76	0.90	0.44	-0.82	0.90	0.47	-0.76	0.91	0.33	-1.10	0.94	0.53	-0.64	0.86	0.57	-0.56	0.89			
managers	2.20	0.79	0.85	2.12	0.75	0.84	2.47	0.91	0.84	2.21	0.80	0.85	2.01	0.70	0.82	1.97	0.68	0.81			
professional	1.02	0.02	0.68	1.05	0.05	0.69	1.01	0.01	0.68	1.00	0.00	0.69	1.11	0.11	0.68	1.10	0.09	0.68			
assocprof	2.33	0.85	0.64	2.25	0.81	0.65	2.18	0.78	0.64	2.27	0.82	0.66	2.21	0.79	0.65	2.26	0.81	0.65			
25-99	0.71	-0.35	0.54	0.71	-0.34	0.53	0.63	-0.46	0.54	0.73	-0.31	0.53	0.66	-0.41	0.52	0.68	-0.39	0.51			
100-499	2.25	0.81	0.53	2.29	0.83	0.52	2.30	0.83	0.53	2.35	0.85	0.52	1.95	0.67	0.50	1.83	0.60	0.50			
500plus	1.22	0.20	0.60	1.24	0.21	0.60	1.17	0.15	0.61	1.24	0.21	0.61	1.03	0.03	0.57	0.91	-0.10	0.58			
private	1.40	0.34	0.54	1.18	0.17	0.55	1.53	0.42	0.55	1.65	0.50	0.55									
sandwich	1.09	0.08	0.45																		
startsal	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00			
d6f1				1.37	0.32	0.22				1.45	0.37	0.20									
d7f1							0.81	-0.21	0.22												
d9f4										1.15	0.14	0.21									
d9f5										0.96	-0.04	0.21									
d9f6										0.70	-0.35	0.21				0.73	-0.31	0.19			
d9f7										0.96	-0.04	0.22									
constant		0.25	1.83		0.26	1.85		0.65	1.83		0.32	1.88		0.23	1.69		0.13	1.69			
Number of obs =	191			Number of obs =			191			Number of obs =			191			Number of obs =			191		
chi2(26) =	53.84			chi2(25) =			54.35			chi2(28) =			57.48			chi2(20) =			53.49		
Log Likelihood =	-104.7			Log Likelihood =			-103.7			Log Likelihood =			-102.9			Log Likelihood =			-104.9		
				Log Likelihood =			-105.2														

8.6 Graduate salaries

Finally, we turned to a conventional indicator of labour market performance, namely graduates' current salaries. Our OLS regressions controlled for several factors which regularly feature in studies of the determinants of graduate earnings, for example, age, subject and degree class (Dolton, Makepeace and Inchley, 1990; Naylor, Smith and McKnight, 2001) as well as others which are less common such as industry, occupation and size of employing establishment. In this sample, salary levels were found to be positively and significantly associated with age, experience, attendance at a pre-1992 University and employment in managerial occupations, large establishments and the private sector. (Note that the strong link with attendance at an Old University may reflect the absence of a social class variable in our dataset).

When the employability skills variables were included as independent variables (Table 9.9, Equations 2-4), they contributed very little to the explanatory power of the model and their coefficients were, with one exception, all small and insignificant. The exception was D9F7 -- the variable summarising graduates' perceptions of the extent to which information processing and written communication skills had been helped by university studies -- which was small, negative and weakly significant (92%) in Equation 4. However, this did not survive in more restricted specifications such as Equation 5 which omitted the Old University variable. The central finding -- of small and insignificant coefficients on employability skills variables -- persisted in a wide range of different specifications (results not shown), including versions of Equations 2-3 which omitted the Old University variable.

Table 8.9: OLS regressions using graduates' current salaries as dependent variable

Dependent variable: ln salary = log of current annual gross salary (OLS estimates)

	1. Base specification		2. Drop sandwich and A-level variables, add d6f1		3. Replace d6f1 with d7f1		4. Replace d7f1 with d9f4-d9f7		5. Alternative specification without Old University variable	
Independent variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
male	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.04	0.02	0.05
age	0.12	0.03 ***	0.13	0.03 ***	0.12	0.03 ***	0.13	0.03 ***	0.12	0.03 ***
agesqd	0.00	0.00 ***	0.00	0.00 ***	0.00	0.00 ***	0.00	0.00 ***	0.00	0.00 ***
alevel	0.00	0.00								
dnonalev	0.01	0.06								
olduniv	0.18	0.06 ***	0.21	0.05 ***	0.21	0.05 ***	0.18	0.05 ***		
degclass	0.06	0.05	0.09	0.05 *	0.07	0.05	0.10	0.05 **	0.14	0.05 ***
postgrad	-0.03	0.06	-0.02	0.06	0.00	0.06	0.00	0.06		
biology	-0.06	0.09	-0.06	0.09	-0.06	0.09	-0.07	0.09	-0.05	0.09
business	0.10	0.08	0.10	0.08	0.13	0.08	0.11	0.08	0.09	0.08
compstudies	0.03	0.10	0.04	0.10	0.06	0.10	0.01	0.10	0.02	0.10
design	-0.17	0.12	-0.18	0.12	-0.16	0.12	-0.18	0.12	-0.27	0.12 **
history	-0.02	0.10	0.00	0.10	-0.03	0.09	-0.01	0.10	0.05	0.10
busserv	0.05	0.10	0.04	0.09	0.08	0.09	0.04	0.10	0.02	0.10
compserv	0.16	0.11	0.15	0.11	0.13	0.11	0.15	0.11	0.16	0.11
othserv	-0.02	0.09	-0.04	0.09	-0.01	0.09	-0.02	0.09	-0.04	0.10
manufg	-0.04	0.10	-0.05	0.10	-0.03	0.10	-0.05	0.10	-0.08	0.11
manager	0.25	0.09 ***	0.26	0.09 ***	0.27	0.09 ***	0.26	0.09 ***	0.27	0.09 ***
professional	0.08	0.08	0.08	0.07	0.08	0.07	0.07	0.08	0.08	0.08
assocprof	0.13	0.07 *	0.13	0.07 *	0.13	0.07 *	0.11	0.07	0.13	0.08 *
25-99	0.02	0.06	0.02	0.06	0.04	0.06	0.00	0.06	-0.02	0.06
100-499	0.09	0.06	0.09	0.06	0.11	0.06 *	0.09	0.06	0.08	0.06
500plus	0.15	0.06 **	0.16	0.06 **	0.16	0.06 ***	0.15	0.06 **	0.18	0.06 ***
private	0.15	0.06 ***	0.13	0.06 **	0.14	0.06 **	0.16	0.06 ***	0.13	0.06 **
sandwich	0.06	0.05								
d6f1			0.03	0.02						
d7f1					-0.01	0.02				
d9f4							-0.03	0.02	-0.05	0.02 **
d9f5							-0.01	0.02	-0.01	0.02
d9f6							0.00	0.02	-0.01	0.02
d9f7							-0.04	0.02 *	-0.03	0.02
constant	7.31	0.57 ***	7.26	0.54 ***	7.31	0.53 ***	7.27	0.54 ***	7.57	0.54 ***
	Number of obs = 192		Number of obs = 192		Number of obs = 187		Number of obs = 192		Number of obs = 192	
	Adj R-squared = 0.316		Adj R-squared = 0.321		Adj R-squared = 0.332		Adj R-squared = 0.325		Adj R-squared = 0.277	
	SEE = 0.258		SEE = 0.257		SEE = 0.251		SEE = 0.256		SEE = 0.265	

8.7 The impact of employability skills development on labour market performance: assessment

When the results of the above analyses are viewed in conjunction with those described in Chapter 3 (based on First Destinations data), certain conclusions start to emerge (see Table 8.10):

1. Student participation in structured work experience as part of their courses (typically through sandwich placements) is strongly positively associated with performance indicators defined in terms of initial employment status (six months after graduation). However, this type of work experience has no statistically significant effect on any of the indicators relating to graduates' performance at later stages in their working lives, for example, their salary levels after one to three years or the probability that, after a similar period of time, they will have had a significant increase in responsibilities accompanied by a pay increase.

2. At departmental level our measure of the degree of involvement in teaching, learning and assessment of employability skills does not appear to have any significant effect on labour market performance six months after graduation. This conclusion receives partial support from analysis of the determinants of graduates' performance after one to three years in employment, using measures of employability skills development based on graduates' perceptions of the time and emphasis devoted to such skills during their studies and of the extent to which they believed they had been helped by their university studies to acquire certain types of employability skills. Most measures of the latter kind – relating to skills development at university – have no significant effects on performance. However, when their coefficients do achieve statistical significance, they turn out to be negatively-signed, for example, in equations modelling the formation of graduates' current salaries or the probability of graduate skills being well-utilised in employment (Table 8.10, Column 6). As discussed above (Section 8.2) this may well reflect a degree of 'mismatch' for some graduates between the skills acquired at university and the skills they are required to use in employment.³

3. Analysis based on the survey of paired graduates and line managers suggests that one measure of universities' involvement with employability skills – graduates' perceptions of the amount of time devoted to activities such as group or team projects,

³ See Section 7.3.2 for a detailed comparison of skills developed at university with skills required in employment.

Key Skills courses or oral presentations – is significantly associated with graduate job performance as proxied by managers' expectations about their future careers and, to a lesser extent, with the probability of promotion accompanied by a pay increase. However, the strength of this finding is undermined by the lack of significant effects attributable to a similar measure based on graduates' perceptions of the emphasis given by university teachers to employability skills.

4. Taken together, these results suggest that identification of the independent effects of employability skills formation in HE on graduates' labour market performance is highly sensitive to the choice and definition of the different measures involved and to model specifications. Depending on the measure used, significant effects of employability skills are sometimes found to be negatively-signed (apparently reflecting under-utilisation of some employability skills in employment) and sometimes positive (for example, the effects of structured work experience and employer involvement in courses on the probability of finding graduate-level employment).

5. Furthermore, the findings with respect to the effects of participation in sandwich placements (and other forms of work experience during undergraduate studies) suggest that any independent effects of employability skills development in HE may be strongest in the very early stages of graduate careers and then tend to diminish rapidly over time as graduates acquire more job and occupation-specific skills and knowledge through on-the-job training and experience.

Table 8.10: Summary of findings on effects of employability skills development on labour market performance indicators

Survey	No. of graduates in selected subjects	Typical period of time in labour market at time of survey	Labour market performance indicator	Effects of departmental-level measures of employability skills development <i>TLA = Teaching, learning and assessment of employability skills</i> <i>EI = Employer involvement in course design and delivery</i>	Effects of individual-level measures of employability skills (ES) development <i>Sandwich = participation in structured work experience as part of course</i> <i>ES time = graduate perceptions of time spent in degree course on ES-related activities</i> <i>ES emphasis = graduate perceptions of university teachers' emphasis on ES</i> <i>ES development = graduate perceptions of extent to which ES were developed by their university studies</i>
First Destinations, 2000	3589	6 months	In employment (as against being unemployed or economically inactive)	TLA – no significant effect EI – no significant effect	Sandwich – large, positive, significant effect
First Destinations, 2000	3284	6 months	Employed in graduate-level occupation	TLA – no significant effect EI – moderately large, positive and significant effect	Sandwich – large, positive, significant effect
Paired Graduates & Line Managers, 2001	192	1-3 years	Graduates believe their skills and knowledge are well-utilised in current jobs		Sandwich – no significant effect ES time – no significant effect ES emphasis – no significant effect ES development – no significant effect except for IT skills which have large negative significant effect
Paired Graduates & Line Managers, 2001	192	1-3 years	Managers believe graduates will be in much more senior position in three years time		Sandwich – no significant effect ES time – large positive significant effect ES emphasis – no significant effect ES development – no significant effect
Paired Graduates & Line Managers, 2001	192	1-3 years	Graduates have had significant increases in responsibilities since started current jobs, accompanied by pay increase		Sandwich – no significant effect ES time – sometimes positive significant effect (depending on specification) ES emphasis – no significant effect ES development – no significant effect except for information processing / written communication skills which sometimes have negative significant effect (depending on specification)
Paired Graduates & Line Managers, 2001	192	1-3 years	Graduates' current annual gross salaries		Sandwich – no significant effect ES time – no significant effect ES emphasis – no significant effect ES development – no significant effect except for presentation and inter-personal skills and information processing / written communication skills which sometimes have small negative significant effects (depending on specification)

8.7 Future Research

We conclude with a consideration of some of the implications of our findings for further research on graduate employability.

Our findings with respect to the effects of participation in sandwich placements (and other forms of work experience during undergraduate studies) suggest that any independent effects of employability skills development in HE may be strongest in the very early stages of graduate careers and then tend to diminish rapidly over time as graduates acquire more job- and occupation-specific skills and knowledge through on-the-job training and experience.

On the face of it, this carries the implication that labour market performance measures relevant to later stages in graduate careers may not be suitable for capturing the effects of different approaches to teaching in HE on graduate employability. It may be that performance measures relating to HEIs' success in delivering employability skills need to be confined to the first few months of graduates' careers (which is the time when First Destinations data are collected).

Clearly, it would be desirable to investigate these issues further through a much larger and more representative sample survey than it was possible to achieve with our chosen methodology of seeking to interview matched pairs of graduates and line managers. Such a survey could usefully be confined to managers alone in order to ascertain the extent of any gaps they perceive in the employability skills of newly-recruited graduates and the extent to which employers take responsibility for providing training to plug such gaps in skills. This would be a useful check on the findings for our own sample that 'missing' skills often concerned areas of skill and knowledge that are best acquired (or can only be acquired) *after* starting employment rather than beforehand.