Employability Skills Initiatives in Higher Education: What Effects Do They Have On Graduate Labour Market Outcomes?

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Abstract

This paper makes use of detailed information gathered at university department level, combined with graduate survey data, to assess the impact of different kinds of employability skills initiative on graduate labour market performance. We find that structured work experience has clear positive effects on the ability of graduates, firstly, to find employment within six months of graduation and, secondly, to secure employment in 'graduate-level' jobs. The latter job quality measure is also positively associated with employer involvement in degree course design and delivery. However, a measure of departmental involvement in explicit teaching and assessment of employability skills is not significantly related to labour market outcomes.

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1. Introduction [1]

In the wake of rapid growth in higher education (HE) participation in the UK, and the increase in global market competition experienced by many employers, UK universities came under intense pressure to equip graduates with more than just the academic skills traditionally represented by a subject discipline and a class of degree. A number of reports issued by employers' associations and HE organisations urged universities to make more explicit efforts to develop the 'key', 'core', 'transferable' and/or 'generic' skills needed in many types of high-level employment (AGR 1993, 1995; CBI 1989, 1994, 1999; CVCP 1998; CIHE 1996).

From the perspective of employers, 'employability' often seems to refer to 'work-readiness', that is, possession of the skills, knowledge, attitudes and commercial understanding that will enable new graduates to make productive contributions to organisational objectives soon after commencing employment. Indeed, studies of employer demand for graduates in engineering and science disciplines have found that appropriate work experience and evidence of commercial understanding rank highly as selection criteria because of commercial pressures to seek graduates who will not require long 'learning curves' when they start employment (Mason, 1998, 1999).

However, in an extended discussion of the employability concept, Hillage and Pollard (1998:11) put more emphasis on individuals possessing the capability 'to move self-

sufficiently within the labour market to realise potential through sustainable employment'. In a similar vein Harvey and Morey (2003) highlight the skills which graduates need in order to manage their own careers and those which will enable them to continue learning throughout their working lives

These broader conceptions of employability partly reflect the influence of the 1997 Dearing Report which identified a set of key skills which were 'relevant throughout life, not simply in employment' (NCIHE, 1997, Para. 9.18) Dearing defined these skills as *Communication*, *Numeracy*, *IT* and *Learning how to learn* at a higher level and recommended that provision of such skills should become a central aim for higher education.

These recommendations have been backed up by a number of government-funded initiatives and programmes designed to encourage the development of such skills within HE and, more generally, to enhance the employability of graduates, for example, the Enterprise in Higher Education Initiative and HE 'Development Projects' covering areas such as Key Skills, Careers Guidance and Work Experience.[2]

Within HE the generic skills needed to enhance graduate employability (whether defined in terms of immediate work-readiness or longer-term career prospects) are now typically seen as including the skills emphasised by Dearing and also *Literacy, Problem-solving skills* and *Team-working skills*. In addition, the employability skills agenda is commonly defined to include *'Understanding of the world of work'* which

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[2] For overviews and case studies of a number of employability skills development projects of this kind see: http://www.universitiesuk.ac.uk/employability/ and http://www.ltsn.ac.uk/genericcentre/

typically refers to knowledge about the ways in which organisations work, what their objectives are and how people in those organisations do their jobs (Coopers and Lybrand, 1998).

University responses to this agenda typically include modifications to existing course content (sometimes in response to employer suggestions), the introduction of new courses and teaching methods and expanded provision of opportunities for work experience – all intended to enhance the development of employability skills and/or ensure that the acquisition of such skills is made more explicit. In some cases university departments have sought to 'embed' the desired skills within courses; in other departments students are offered 'stand-alone' skills courses which are effectively 'bolted on' to traditional academic programmes (ibid). In fact many university departments now use a mix of embedded and stand-alone teaching methods in their efforts to develop employability skills.

As further evidence of the growing importance attached to graduate employability, the Higher Education Funding Council for England (HEFCE) has developed measures of university performance which include indicators of graduate labour market outcomes, for example, the probability of new graduates finding employment after a specified time interval (HEFCE, 2001, 2002, 2003).

In this paper we report on a new empirical investigation of the impact of different kinds of HE employability skills initiative on similar measures of graduates' labour market performance. In particular, we make use of detailed information gathered at

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university department level to develop innovative measures of the extent to which departments engage in teaching and assessment of employability skills, and the extent of employer involvement in course design and delivery as well as measures of student participation in work experience through sandwich courses and related programmes. The study is based on research visits to a total of 34 departments in eight different universities between January-April 2001 and an analysis of First Destination Survey data for some 3589 graduates from the sample departments in the year 2000.

The article is ordered as follows: Section 2 describes the extent and nature of employability skills teaching in sample departments and the new measures used to capture this activity. Section 3 considers theoretical reasons why employability skills development might be expected to contribute to improved matches between graduate job-seekers and employers. Section 4 outlines the empirical models used to explore the links between employability skills development and graduate labour market outcomes. Section 5 presents the main findings of this analysis. Section 6 draws some conclusions.

2. Employability Skills Teaching in Sample Departments

In order to gather in-depth information on employability skills teaching and learning in a cross-section of subjects and universities, semi-structured interviews were held with 60 academic staff and 10 careers staff in 34 departments in eight universities comprising four pre-1992 (Old) and four post-1992 (New) universities (Table 1). These departments covered five subject areas -- Biological Sciences, Business

Studies, Computer Science/Studies, Design Studies and History – which were selected in order to obtain a mix of traditional academic subjects, recently-established and/or rapidly growing vocational subjects and courses where First Destinations data point to a wide range of experiences of initial entry to employment. As shown in Table 1, the Biological Sciences, Business Studies and Computing departments were spread across a mix of Old and New Universities. By contrast, the sample History departments were all in Old Universities while the Design departments were all in New Universities.

TABLE 1 ABOUT HERE

The interviews sought respondents' views on definitions of employability; learning, teaching and assessment of employment-related skills and knowledge; employer involvement with programmes of study; student work experience; and other employability initiatives. The findings revealed wide differences between departments and between subjects in the ways that teaching staff sought to provide employability skills-enhancing experiences. Some differences of approach between pre-1992 and post-1992 universities could be discerned but, in the three subjects that were offered in both categories of institution, there was no clear distinction between Old and New Universities.

In Biological Sciences, all respondents acknowledged their responsibility for producing graduates who were employable both within the Biological Sciences field and outside it. Most Biological Science departments had been quick off the mark in adapting courses to focus more on teaching communications, presentation and other generic skills.   Conversely, while the History respondents reported a similar

awareness of the wide range of occupations entered by their graduates, they still tended to focus on equipping their graduates with the skills they saw as essential for a good historian in the belief that these skills themselves were transferable into diverse occupations (for example, the skills involved in information processing and the development of coherent and convincing arguments).

On the whole, respondents in Computer Studies, Business Studies and Design departments were more likely to see their subjects as vocationally orientated. However, there were variations in how this influenced the delivery of employability skills teaching. For example, the Design courses all explicitly sought to equip students with employability skills, in part because many of their graduates enter a very competitive economic environment with many small enterprises in which graduates are required to have a range of management and business skills as well as technical proficiency in design (Blackwell and Harvey, 1999). In Business Studies departments specialist subject knowledge and theoretical knowledge were seen as intrinsically related to the development of the generic skills needed for general management roles.

By contrast, a relatively low emphasis on employability skills in several Computer Science departments was attributed to high labour market demand for IT graduates at the time of the interviews. Most of the Computing departments actively sought to combine specialist knowledge teaching with the development of generic skills but it was reported that the easy routes into employment for Computer Science graduates led to some resistance from students to engaging with broader employability skills.

In all subjects except History, a majority of respondents were able to provide examples of recently introduced approaches to teaching, learning and assessment that were intended to enhance employability, although the extent to which these were deployed varied between universities. Nearly all the departments visited stated that their principal intention was to embed key skills in the curriculum rather than address them through stand-alone courses. Examples of such embedding included a greater emphasis on oral presentations, the use of more 'real world' examples in teaching, more group working and the introduction of more final-year projects (intended to develop independent learning skills). There were also examples of changes in assessment practices (such as increased weighting in assessment for problem-solving and numeracy skills and lower weighting for theoretical knowledge). Where stand-alone generic skills courses did exist in some departments, these were often seen as necessary to fill gaps in students' skills in areas such as maths and grammar.

The incidence of structured work experience as part of degree courses varied widely by subject. In History departments there was little or no such provision. By contrast, the provision and take up of work experience for Business Studies students was relatively high in both Old and New Universities. The four Design departments also all reported considerable opportunities for students to take part in work experience placements. In Biology only one of the three Old University departments made provision for work experience whereas in three of the four New University departments it was widespread. In a majority of Computer Science departments the most common form of work experience for students was course-related part-time and summer paid work.

Employer involvement in course design and delivery took forms such as commenting on the relevance of course content to future employment prospects, providing material and ideas for student projects and giving guest lectures. In some cases this employer involvement occurred through formal membership of course advisory panels; in other cases it largely depended on personal contacts between employer representatives and university staff. Employer involvement of some kind was widespread and often integral in Design Studies, variable in Computer Studies departments and almost non-existent in History. In the two other subjects there were marked differences between institutions in contacts with employers but not on any clear Old-New University lines. This partly reflected location. For example, some Biological Sciences departments had ready access to nearby employers who regularly recruited Biology graduates; others did not.

In order to quantify the differences between departments in involvement in employability skills development, each department was ranked on a four-point scale on six different measures:

(1) the emphasis given to teaching and learning of the following employability skills: Communication, Numeracy, Literacy, Information Technology, Problem-solving, Understanding world of work, Team-working

(2) the emphasis given to employability skills in undergraduate assessment

(3) the relative importance of employability skills compared to subject knowledge and theoretical understanding

(4) the extent and impact of employability skills-related innovations in courses in the 10 years prior to our visits

(5) the extent and impact of employer involvement in course planning, design, teaching and assessment

(6) the proportion of students undertaking work placements as part of their studies and/or engaging with industry-based project work of different kinds

Measures (1)-(3) were based on departmental respondents' replies to written question-sheets in which they were invited to classify the importance of employability skills in teaching, learning and assessment on a four-point scale. Measures (4)-(6) were based on responses to interview questions and data provided by departments. The results of these rankings are shown in Tables 2A-2F. We now go on to incorporate these measures into our analysis of the links between employability skills initiatives in HE and graduate labour market outcomes.

TABLE 2 ABOUT HERE

3. Theoretical framework

As described above, employability skills teaching is explicitly aimed at enhancing graduates' skill sets in ways that should increase their attractiveness to potential employers. This is an underlying rationale for the inclusion of graduate labour market outcomes in measures of university performance developed by HEFCE (discussed in Section 1). 'Success' in the graduate labour market is typically defined as graduates securing employment in jobs which make appropriate use of the skills and knowledge developed in the course of their university studies.

In matching theory, labour market 'failure' on the part of individual graduates – unemployment or underutilisation of graduate-level skills in employment -- reflects mismatches between graduates and employers which may come about for a number of reasons. For example, Coles and Smith (1998) emphasise that in a random matching model mismatches between job-seekers and employers may arise because of imperfect information, resulting in time and search costs for prospective partners to obtain information about better matches. They also propose an alternative 'stock-flow matching' model in which, after an initial round of match-making, agents may simply wait for appropriate partners to enter the market in a later time period. Other strands of matching theory emphasise the role of institutional and labour market rigidities in contributing to mismatches between job-seekers and employers, for example, the higher incidence of underutilisation of skills among female graduates who combine part-time employment with care of young children (Green, McIntosh and Vignoles, 2002).

In a recent investigation of labour market mismatches in the Netherlands, Allen and van der Velden (2001) find that 'education-job mismatches' (individuals holding jobs for which their formal qualifications are higher or lower than required) do not correspond closely with 'skill-job mismatches' (individuals holding jobs for which their skills are above or below those required). One possible explanation for this is that, within given educational qualification categories such as degree-holders, there may be unmeasured differences in skills between individuals, and individuals deemed by employers to be relatively low-skilled may be less likely than others in their qualification group to be offered jobs which require their level of formal qualification.

Recent UK evidence in support of this hypothesis of 'heterogeneous skills within qualification levels' has been presented by Green and McIntosh (2002) who find that less than half of people identified in the 2001 Skills Survey as over-qualified (in terms of formal certification) for their jobs were also over-skilled (that is, in their own evaluation, not making much use of their skills and abilities in their present jobs).

Another proposition advanced by Allen and van der Velden is that the selection criteria used by employers when screening job applicants may include factors such as work experience, gender and social background which are distributed unevenly within educational qualification categories. This is another potential line of explanation why individuals with similar levels of formal certification may encounter varying degrees of success in securing employment in jobs which make use of their graduate-level skills and knowledge.

Thus matching theory, together with the literature on overeducation and underutilisation of skills, points to several reasons why the teaching, learning and assessment of employability skills might be expected (all else being equal) to contribute to superior labour market outcomes for graduates in possession of those skills.

Assume that some university departments make concerted efforts to develop employability skills in the ways described in Section 2 while others do not. Graduates from the first type of department will be referred to as 'ES graduates' in contrast to 'Non-ES graduates' from the second type of department.

Firstly, the quality of employer-graduate matches in the labour market (and the speed with which such matches are achieved) should be improved for ES graduates relative to non-ES graduates by the better information which ES graduates acquire about alternative job prospects as a result of their exposure to different employment conditions during industrial placements and/or to course content which is explicitly related to practical applications of subject matter in employment. The latter source of information is especially likely to be enhanced for ES graduates from departments where employers have been involved in the design and delivery of courses.

Secondly, employers' information about job applicants is likely to be improved by their involvement in providing student work placements or by their relationships with certain university departments which are built up in the course of contributing to course design and delivery. Even employers who do not have direct links with any university departments will be able to obtain references for ES graduates which have been supplied by other employers who do provide placements. In addition, the job applications made by ES graduates may contain information about the development of problem-solving, team-working and other skills ostensibly valued by employers which may increase their chances of being called to interviews where they will have a chance to demonstrate their suitability for the jobs in question.

Thirdly, the uneven spread of employability skills teaching can be expected to increase the heterogeneity of skills among graduates in ways that will favour ES graduates in terms of securing jobs which formally require possession of a degree. All else being equal, we can expect employers to favour job applicants who can demonstrate practical skills and commercial understanding gained during work

placements and the high-quality communication and other generic skills which employability skills teaching sets out to develop.

In this context, we derive the following hypotheses regarding the expected impact of employability skills teaching on graduate labour market outcomes:

H1: The probability of graduates finding employment within a short time after graduating will, all else being equal, be positively related to the extent to which employability skills development featured in their undergraduate programmes, as measured by:

A: the provision of work experience placements for students

B: employer involvement in course design and delivery

C: the emphasis placed on teaching, learning and assessment of employability skills by their departments

H2: The probability of graduates taking up employment in jobs where their skills and knowledge are well utilised will, all else being equal, be positively related to the same three variables (A), (B) and (C).

4. Empirical Models

Recent efforts to evaluate UK universities' efforts in developing graduate employability skills have made use of available data from the annual First Destinations Survey of full-time undergraduate leavers from UK universities which is

carried out by the Careers Service at each university and captures information on students' employment outcomes roughly six months after graduation. The performance indicators developed to date have typically focussed on graduates' success in finding employment after graduation and in their being employed in a job deemed, by specified criteria, to be of 'graduate quality'.

For example, in a study of 1993 leavers from pre-1992 Universities, Smith, McKnight and Naylor (2000) find that the probability of student leavers being employed six months after graduation is positively related to the class of degree and is also strongly influenced by the subject studied, measures of prior educational attainment (such as A level point scores), age at graduation and social class background. Most of these factors are also found to strongly affect the probability of student leavers in employment being in a 'graduate occupation' although age at graduation has only a weakly significant effect for female graduates and no significant effect for males.

The definition of a 'graduate occupation' by Smith et al includes both 'traditional graduate' and 'graduate track' occupations as defined by McKnight (1999) in the following categorisation:

'traditional graduate' occupations, eg doctors, lawyers, qualified engineers, teachers, high-level managerial and technical occupations

'graduate track' occupations, eg low level management jobs, technician jobs, skilled caring jobs, high level sales jobs – that is, jobs which require high levels of education, are increasingly filled by graduates and which often constitute entry routes to higher level positions

'non-graduate' occupations (those which clearly do not require high level qualifications and which are unlikely to make use of graduate-level skills and knowledge)

Six months after graduation is a very early stage in graduates' careers and the *Moving On* survey of 1995 graduates (Elias, McKnight et al, 1999) found that the likelihood of being employed in a non-graduate occupation declines over the first few years after graduation as some individual graduates manage to secure graduate-level employment after first accepting a period of lower-level employment. However, an initial period of under-employment was found to have lingering negative effects on those graduates' salary and career development, suggesting that data on employment status six months after graduation may in fact be useful indicators of future labour market prospects.

Later work in a similar vein by HEFCE (2001) has developed benchmarks for institutional performance with regard to graduate employability using a multi-level model which relates employment indicators for individual graduates in 1999-2000 to a number of potentially relevant student-level and institution-level characteristics. This work combined data from the First Destinations Survey of student leavers with data from the Combined Student Module Record held by HESA (Higher Education Statistics Agency), supplementary files supplied by UCAS (Universities and Colleges Admissions Service) and the Labour Force Survey.

For the present study we make use of an augmented version of the HEFCE dataset to test the two sets of hypotheses derived above in relation to June 2000 graduates from the 34 departments we had visited. This is done by modelling the probabilities that

graduates are (1) employed as compared to being unemployed and (2) employed in a 'graduate quality' job as:

(1) $\Pr\left(Emp_i = 1 \middle| X_i\right) = f\left(X_i \beta\right)$

(2) $\Pr\left(GradJob_i = 1 \middle| X_i\right) = f\left(X_i \beta\right)$

where:

$$Emp_i \begin{cases} = 1 \text{ if the graduate is employed six months after graduation} \\ = 0 \text{ if the graduate is unemployed six months after graduation} \end{cases}$$

and

$$GradJob_i \begin{cases} = 1 \text{ if the graduate is employed in a graduate or 'graduate track' occupation} \\ \quad \text{six months after graduation} \\ = 0 \text{ if the graduate is employed in a non - graduate occupation six months} \\ \quad \text{after graduation} \end{cases}$$

and X_i is a vector of individual, department-level and university-level characteristics which might be expected to influence labour market outcomes. The definitions of graduate, graduate track and non-graduate occupations are taken from McKnight (1999) as described above.

The individual characteristics include gender, age on entry, ethnic group, A level scores, degree classification, subject of study, whether he/she participated in a sandwich training placement, whether his/her parents reside in a 'low HE participation' neighbourhood and indicators of parental social class. We thus control for a number of indicators which Allen and van der Velden (2001) suggest may be used as selection criteria by employers when screening applications from job-seekers.

The university-level characteristics relate, firstly, to whether the institution is an Old or New University and, secondly, to indicators of labour market pressure in each university's locality, for example, in Equation (1) the local unemployment rate among 20-29 year olds and, in Equation (2), the percentage of local jobs classified as 'graduate jobs'.

The department-level characteristics comprise three different measures of the extent to which employability skills feature in undergraduate programmes:

    departmental involvement in teaching, learning and assessment of employability skills (derived from Tables 2A-2D above)

    student participation in work experience (Table 2E)

    employer involvement in course design and delivery (Table 2F).

Given that our departmental data were gathered during research visits in 2001, it was necessary to review interview data in order to ensure that so far as possible the employability skills teaching measures reflected teaching and learning practices during the period 1996/7 to 2000 when most 2000 graduates were attending university. This led to appropriate downward adjustments being made for 10 out of the 34 departments which had only recently introduced certain innovations in respect of employability skills teaching, and it was these adjusted measures of involvement in employability skills development which were included in the statistical analysis (see Tables 4 and 5 for variable definitions and descriptive statistics).

In total data were available for 4676 graduates in the five selected subject areas from the 34 departments in year 2000 which completed First Destinations returns. In our analyses we focus on the 3589 graduates among this group who were either employed or unemployed at the time of the 2000 First Destinations Survey (Table 3).

TABLES 3, 4 AND 5 ABOUT HERE

5. Employability Skills Development and Graduate Employment Outcomes

Table 6 shows the results of a logistic regression analysis of the factors determining the probability that individual graduates from the 34 departments are employed as against being unemployed. In the base specification (Equation 1), the probability of being employed is found to be significantly and positively related to holding a First Class or Upper Second degree and with students having participated in a sandwich placement during their studies. [3]

The odds ratios reported for significant independent variables effectively compare the probability of an 'event' occurring, all else being equal, with the probability of its not occurring. Thus for example, in Table 6, Equation 4 the probability of graduates with a First Class or Upper Second degree being employed is almost a third higher than for

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[3] 'Sandwich' training placements involve undergraduate students undertaking a fixed period of structured employment-based training as part of their degree course. Such placements usually take place inbetween Years 2 and 3 of a First degree course, typically for 12 months but sometimes for 3-6 months.

graduates with a lower class of degree (after controlling for all the other potential influences represented in the equation). In the same equation the probability of former sandwich students being in employment is more than twice as high as for graduates who did not undertake sandwich training. It is possible that the relationship with sandwich placements partly reflects unobserved characteristics of students who choose to undertake sandwich courses, for example, a high level of motivation to gain employment-related skills and to develop contacts relevant to future employment.

The significant negative influences on the probability of being in employment six months after graduation, all else being equal, are being male rather than female, attending a university with a relatively high unemployment rate among 20-29 year olds in its locality and having taken a degree in design studies. This result for design graduates reflects the markedly different early employment patterns of graduates in that subject who tend to take longer to develop a career, for example, needing to establish a portfolio and make useful contacts in order to win contracts for freelance and commissioned work (Blackwell and Harvey, 1999).

TABLE 6 ABOUT HERE

These findings are all broadly consistent with those of Smith et al (2000) and the HEFCE study based on 1999-2000 graduates in a full range of degree subjects (HEFCE, 2001) and point to the suitability of the base specification for testing Hypotheses 1A-1C by entering our department-level measures of employability skills development as independent variables.

The initial results in Table 6, Equation 2 suggest that none of the three measures are significantly associated with the probability of graduates finding employment. Given the unsurprisingly high correlation between individual-level sandwich participation and the departmental work experience variable (Table 7), it was considered appropriate to omit the latter variable in Equation 3 but this has no impact on the significance levels attached to the two remaining employability skills measures. Similar results are obtained in Equation 4 which omits the Old University variable (which is negatively correlated with all three measures of employability skills development).

TABLE 7 ABOUT HERE

We conclude that these results provide no support for H1B or H1C. However, H1A regarding the expected positive impact of departmental provision of student work placements on matches between graduates and employers receives indirect support from the positive and significant coefficient attached to the individual-level sandwich participation variable.

The second set of logistic regressions shown in Table 8 test Hypotheses 2A-C by modelling the probability that employed graduates from the 34 departments are in graduate-level occupations, that is, in either 'traditional graduate' or 'graduate track' occupations as defined above. The base specification is similar to that in Table 6 except that the measure of unemployment of 20-29 year olds in each university's locality is replaced with a measure showing the percentage of jobs which are of graduate level in each locality. Table 8, Equation 1 shows that the coefficients on the

degree class, sandwich participation and 'percent graduate-level jobs' variables are all positive and significant as are the coefficients on the computing and business studies subject variables (as compared to the reference category of biological sciences). Interestingly, in contrast to the previous analysis of factors determining the probability of being employed rather than unemployed, the coefficient on the male variable is now positive and significant, supporting an argument that, all else being equal, male graduates are more likely than females to remain unemployed rather than accept a job below graduate level.

When the departmental-level employability skills measures are added to Equation 2, the coefficient on the work experience variable is positive and significant (p=0.06) while the coefficient on employer involvement in courses is positively signed but falls just short of statistical significance (p=0.11). By contrast, the coefficient on the teaching, learning and assessment measure is not significantly different from zero. When the departmental work experience variable is dropped in Equation 3 to reduce overlap with the individual-level sandwich variable (see above), the employer involvement measure remains positive and gains in significance (p=0.01) while the teaching/learning/assessment variable remains insignificant. These findings persist in Equation 4 which also omits the Old University variable. In both Equations 3 and 4, a one unit change in the level of employer involvement in course design and delivery is associated – all else being equal -- with an estimated 29% increase in the probability of graduates being employed in a graduate-level job.

TABLE 8 ABOUT HERE

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These findings provide strong support for H2A and H2B but not for H2C. They point to the following main conclusions:

1. In terms of influences on initial labour market outcomes for graduates, structured work experience during courses has highly positive effects and appears to predominate over other approaches seeking to develop employability skills in HE. However, the apparent strength of the relationship between sandwich participation and subsequent employment may in part reflect unobserved characteristics of students who choose to follow courses with a sandwich component.

2. After controlling for gender, age, intellectual ability (proxied by A level scores), degree class, degree subject and a range of other potential influences, employer involvement in course design and delivery is also positively associated with an occupation-based measure of the quality of initial employment found by graduates. However, there is no evidence of a significant independent effect of the efforts devoted by university departments to the teaching, learning and assessment of employability skills.

6. Summary and assessment

In recent years considerable resources have been devoted to efforts to develop graduate employability skills in UK universities. In this article we assess the impact of different kinds of HE employability skills initiative on measures of graduates' labour market performance. Making use of detailed information gathered at university department level, we distinguish between three different mechanisms by which it is hoped to improve employability skills: the teaching and assessment of such skills by

departments; employer involvement in course design and delivery; and student participation in work experience through sandwich courses and related programmes.

Our findings suggest that structured work experience has clear positive effects on the ability of graduates, firstly, to find employment within six months of graduation and, secondly, to secure employment in graduate-level jobs. The latter job quality measure is also positively and significantly associated with employer involvement in degree course design and delivery.

However, there is no evidence that the emphasis given by university departments to the teaching, learning and assessment of employability skills has a significant independent effect on either of the labour market outcomes considered here.

The strong impact of sandwich participation on labour market performance is consistent with many other research findings. Indeed McKnight (2002) suggests that the effects of this kind of training may be quite durable: she finds a 4.6% salary premium attached to sandwich participation some 3.5 years after graduation after controlling for degree discipline and a range of personal and university characteristics. Even if we allow for the endogeneity issues arising from student selection of courses offering sandwich training, there seems little doubt of its positive effects on employment prospects.

Our finding that employer involvement in course design and delivery may also have an independent positive effect on the quality of graduate employment is new and, taken together with the findings on sandwich participation, suggests that exposing

students to employer priorities and decision-making during their studies has positive effects on the future matches between graduates and their initial employers following graduation.

By contrast, the lack of impact of our measure of teaching, learning and assessment of employability skills gives pause for thought about the level of resources devoted to this activity. Two caveats need to be considered here. Firstly, our measures of labour market performance are relatively narrow and hardly capture all the objectives of employability skills teaching described in Section 1. It is conceivable, for example, that efforts to develop graduates' communication and oral presentation skills during their undergraduate studies have positive effects on their later work performance that are not captured in the present analysis. Secondly, six months after graduation may be considered too soon to assess the impact of different kinds of teaching. However, as noted in Section 3, there is some evidence that employment status six months after graduation is an indicator of future labour market prospects. And it is also likely that the independent effects of any form of teaching in HE tend to be strongest in the early stages of graduate careers and then may diminish rapidly over time as graduates acquire more job- and occupation-specific skills and knowledge through on-the-job training and experience.

The strongly positive effects of student work experience on labour market outcomes serve as a reminder that many relevant employability skills are probably best learned in workplaces rather than in classroom settings. Future initiatives designed to develop employability skills in higher education need to be informed by comprehensive surveys of employers in order to ascertain exactly what gaps they perceive in the

employability skills of newly-recruited graduates and the extent to which they (employers) in fact take responsibility for providing training to plug such gaps in skills. There may be little to be gained from universities seeking to develop skills that are best acquired (or can only be acquired) *after* starting employment rather than beforehand.

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Table 1: Sample university departments analysed by subject area and type of university

Code	Biological Sciences	Business and Management Studies	Computer science/ studies	History	Design studies	
Old A	X	X	X	X		A large pre-1992 Civic university in the Midlands
Old B	X	X	X	X		A former College of Advanced Technology in the south of England which became a Technological University in 1964
Old C	X	X	X	X		A large pre-1992 Civic university in the north of England
Old D			X	X		Old D, Old E and Old F comprise two medium-sized colleges and one large college of a southern University
Old E	X			X		
Old F	X		X	X		
New A	X		X		X	A medium sized post-1992 university in the north of England, focused very much on serving a local community
New B	X	X	X		X	A very large post-1992 university located in the north of England
New C	X	X	X		X	A medium sized post-1992 university in the Midlands
New D	X	X	X		X	A large post-1992 university in the south of England
TOTAL	9	6	9	6	4	

Table 2: Measures of employability skills teaching in sample departments

(A) Importance of employability skills (a) in undergraduate teaching and learning

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	3.2	4.0	3.6		3.4	3.4	3.1	4.0	3.8	3.8
Business Studies	3.9	3.6	3.4					3.7	3.4	3.8
Computing	2.4	3.5	3.3	3.1		3.4	4.0	3.7	3.4	3.4
Design							3.8	3.4	3.6	4.0
History	3.6	3.6	2.9	3.0	2.7	3.1				

(a) Employability skills defined as: Communication, Numeracy, Literacy, Information Technology, Problem-solving, Understanding world of work, Team-working. The emphasis given to teaching and learning of each of these skills was ranked by departmental interviewees on the following four-point scale: 4=Very important, 3=Fairly important, 2=Not very important, 1=Not at all important.

(B) Importance of employability skills in undergraduate assessment (b)

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	2.9	3.0	2.9		3.6	2.6	2.7	4.0	3.4	3.0
Business Studies	3.6	2.9	2.9					3.6	3.6	3.1
Computing	1.5	3.5	3.1	2.8		3.6	3.9	3.1	3.1	2.5
Design								2.6	2.9	2.9	3.6
History	3.4	3.0	2.7	2.7	2.3	2.3				

(b) The emphasis given to assessment of employability skills was ranked by departmental interviewees on the following four-point scale: 4=Very important, 3=Fairly important, 2=Not very important, 1=Not at all important.

(C) Relative importance of employability skills compared to subject knowledge/ theoretical understanding (c)

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	1.0	4.0	4.0		1.0	1.0	1.0	2.0	4.0	2.0
Business Studies	4.0	4.0	1.0					4.0	2.0	3.0
Computing	1.0	3.0	1.0			2.0	2.0	3.0	2.0	1.0
Design							1.0	2.0	2.0	2.0
History	2.0	1.0	1.0	1.0	1.0	1.0				

(c) Defined as the difference between score given to employability skills LESS score given to subject knowledge/theoretical understanding where these two dimensions of teaching were ranked by interviewees on a four-point scale. These differences were then in turn allocated to another four-point scale as follows: 4 = Average score for employability skills 0.5 points or more above average score for subject knowledge/theoretical understanding; 3 = 0.15-0.49 point differential; 2 = -0.14-+0.14 point differential; 1 = Average score for employability skills falls 0.15 or more points below average score for subject knowledge/theoretical understanding.

(D) Major employability skills-related innovations in courses in past 10 years

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	2.0	4.0	4.0		4.0	3.0	3.0	3.0	3.0	3.0
Business Studies	3.0	4.0	1.0					4.0	4.0	3.0
Computing	1.0	3.0	3.0	3.0		4.0	3.0	4.0	3.0	2.0
Design							3.0	4.0	3.0	3.0
History	2.0	2.0	1.0	1.0	1.0	1.0				

Scores:
4 = Wide-ranging efforts to change traditional course content and teaching
3 = Moderate efforts to change traditional course content and teaching
2 = Some minor efforts to change traditional course content and teaching
1 = No evidence of efforts to change traditional course content and teaching methods

Table 2 (continued):

(E) Student involvement in work experience

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	1.0	4.0	1.0		1.0	1.5	3.0	3.0	3.0	1.0
Business Studies	3.0	4.0	1.0					4.0	4.0	4.0
Computing	1.0	4.0	3.0	2.0		1.0	2.0	2.0	4.0	4.0
Design							4.0	4.0	4.0	3.0
History	1.0	1.0	1.0	1.0	1.0	1.0				

Scores:
4 = Average 50% or more of undergraduate students undertake work placements as part of their studies
3 = Average 10-49% of students undertake work placements as part of their studies
2 = Less than 10% of students undertake work placements as part of their studies; some involvement with industry-based project work of different kinds
1 = Less than 10% of students undertake work placements as part of their studies; no involvement with industry-based project work of any kind

(F) Employer involvement in course provision

University	Old A	Old B	Old C	Old D	Old E	Old F	New A	New B	New C	New D
Biology	1.0	4.0	3.0		1.5	1.0	3.0	1.0	4.0	1.0
Business Studies	2.0	2.0	2.0					3.0	3.0	3.0
Computing	4.0	2.0	2.0	1.0		1.0	2.0	2.0	2.0	4.0
Design							4.0	4.0	4.0	3.0
History	1.0	2.0	1.0	1.0	1.0	1.0				

Scores:
4 = Some employer involvement in course planning/design, teaching and assessment
3 = Some employer involvement in course planning/design and teaching but not assessment
2 = Some employer involvement in course planning/design but not teaching or assessment
1= No employer involvement in course planning/design, teaching or assessment

Table 3: Employment status of 1999-2000 graduates from selected university departments who completed First Destinations returns

	Number	Percent
Employed	3284	70.2
Unemployed	305	6.5
Further study or training	712	15.2
Not available for employment	371	7.9
Overseas student returning overseas	4	0.1
TOTAL	**4676**	**100**

Table 4: Definitions of variables

Individual characteristics:	
Employment status	= 1 if employed, 0 if unemployed
Graduate job	= 1 if employed in graduate or graduate-track occupation, 0 if employed in non-graduate occupation
Male	= 1 if male
Age	
Ethnic group	= 1 if non-white
Ethnic group_nk	= 1 if ethnic background not known
A level score	
Non A level	= 1 if didn't take A levels
A level score_nk	= 1 if took A levels but A level score unknown
Degree class	= 1 if First class honours or 2.1 degree
Low participation neighbourhood	= 1 if from low HE participation neighbourhood
Neighbourhood participation rate_nk	= 1 if neighbourhood HE participation rate unknown
Social class	= 1 if parents in social classes IIIm, IV or V
Social class_nk	= 1 if parental social class unknown
Sandwich training placement	= 1 if went on sandwich training placement during undergraduate studies
Subject dummies: reference category = biological sciences	
Computer studies	= 1 if graduated in computer studies / science
Business studies	= 1 if graduated in business studies
History	= 1 if graduated in history
Design studies	= 1 if graduated in design studies
University-level characteristics:	
Old University	= 1 if attended Old University
Local unemployment rate	= unemployment rate among 20-29 year olds in university's locality
Graduate jobs in locality	= percentage of jobs in institution's locality which are classified as graduate jobs
Department-level characteristics:	
Teaching, learning and assessment of employability skills	= measure of teaching, learning and assessment of employability skills in department [1-4 point scale]
Work experience provision	= measure of student participation in work experience at department level [1-4 point scale]
Employer involvement in courses	= measure of employer involvement in course design, teaching and assessment in department [1-4 point scale]

Table 5: Descriptive Statistics

A: Employed and unemployed graduates

Variable name	Obs.	Mean	Std. Dev.	Min.	Max.
Employment status	3589	0.92	0.28	0	1
Male	3589	0.53	0.50	0	1
Age	3589	23.61	3.64	20.5	67.1
Ethnic minority	3589	0.12	0.32	0	1
Ethnic group_nk	3589	0.03	0.17	0	1
A level score	3589	18.39	5.69	2.5	29.5
Non A level	3589	0.28	0.45	0	1
A level score_nk	3589	0.02	0.14	0	1
Degree class	3589	0.56	0.50	0	1
Computer studies	3589	0.24	0.42	0	1
Business studies	3589	0.20	0.40	0	1
History	3589	0.08	0.27	0	1
Design studies	3589	0.17	0.38	0	1
Low participation neighbourhood	3589	0.10	0.30	0	1
Neighbourhood participation rate_nk	3589	0.06	0.23	0	1
Social class	3589	0.17	0.38	0	1
Social class_nk	3589	0.23	0.42	0	1
Sandwich training placement	3589	0.25	0.43	0	1
Old University	3589	0.41	0.49	0	1
Local unemployment rate	3589	7.86	1.24	5.68	9.51
Teaching, learning and assessment of employability skills	3589	2.82	0.57	1.48	3.75
Work experience provision	3589	2.69	1.29	1.0	4.0
Employer involvement in courses	3589	2.54	1.09	1.0	4.0

B: Employed graduates only

Variable name	Obs.	Mean	Std. Dev.	Min.	Max.
Graduate job	3284	0.75	0.43	0	1
Male	3284	0.52	0.50	0	1
Age	3284	23.56	3.55	20.5	67.1
Ethnic minority	3284	0.12	0.32	0	1
Ethnic group_nk	3284	0.03	0.18	0	1
A level score	3284	18.46	5.71	2.5	29.5
Non A level	3284	0.27	0.44	0	1
A level score_nk	3284	0.02	0.13	0	1
Degree class	3284	0.57	0.50	0	1
Computer studies	3284	0.24	0.42	0	1
Business studies	3284	0.21	0.41	0	1
History	3284	0.08	0.27	0	1
Design studies	3284	0.16	0.37	0	1
Low participation neighbourhood	3284	0.10	0.30	0	1
Neighbourhood participation rate_nk	3284	0.06	0.23	0	1
Social class	3284	0.17	0.38	0	1
Social class_nk	3284	0.22	0.42	0	1
Sandwich training placement	3284	0.26	0.44	0	1
Old University	3284	0.42	0.49	0	1
Graduate jobs in locality	3284	27.79	5.91	22.45	39.20
Teaching, learning and assessment of employability skills	3284	2.81	0.57	1.48	3.75
Work experience provision	3284	2.69	1.30	1	4
Employer involvement in courses	3284	2.52	1.09	1	4

Table 6: Logistic regressions using graduates' employment status as dependent variable

	(1)	(2)	(3)	(4)	Odds ratios for coefficients in (4)
Male	-0.615***	-0.608***	-0.617***	-0.622***	0.537
	(0.127)	(0.127)	(0.127)	(0.127)	
Age	-0.019	-0.019	-0.018	-0.020	
	(0.015)	(0.014)	(0.014)	(0.014)	
Ethnic group	-0.201	-0.230	-0.198	-0.238	
	(0.177)	(0.177)	(0.178)	(0.153)	
A level score	0.024	0.028	0.026	0.021	
	(0.019)	(0.018)	(0.018)	(0.017)	
Non A level	-0.181	-0.198	-0.195	-0.166	
	(0.176)	(0.176)	(0.178)	(0.182)	
Degree class	0.276**	0.275**	0.272**	0.276**	1.318
	(0.123)	(0.126)	(0.126)	(0.127)	
Computer studies	0.095	0.037	0.114	0.122	
	(0.244)	(0.279)	(0.255)	(0.247)	
Business studies	0.305	0.119	0.290	0.305	
	(0.292)	(0.360)	(0.290)	(0.285)	
History	0.106	0.176	0.226	0.187	
	(0.263)	(0.428)	(0.396)	(0.404)	
Design	-0.599*	-0.781**	-0.654*	-0.603**	0.547
	(0.326)	(0.385)	(0.341)	(0.297)	
Low participation neighbourhood	-0.254	-0.264*	-0.256*	-0.254	
	(0.156)	(0.155)	(0.155)	(0.156)	
Social class	-0.209	-0.211	-0.208	-0.203	
	(0.142)	(0.141)	(0.140)	(0.141)	
Sandwich training placement	0.838***	0.779***	0.821***	0.843***	2.323
	(0.174)	(0.179)	(0.174)	(0.170)	
Old University	-0.169	-0.109	-0.166		
	(0.261)	(0.259)	(0.255)		
Local unemployment rate	-0.118*	-0.131*	-0.129*	-0.127*	0.881
	(0.071)	(0.077)	(0.074)	(0.072)	
Teaching, learning and assessment of employability skills		0.049	0.070	0.068	
		(0.158)	(0.157)	(0.154)	
Work experience provision		0.120			
		(0.100)			
Employer involvement in courses		-0.007	0.046	0.050	
		(0.110)	(0.105)	(0.107)	
Constant	3.689***	3.374***	3.434***	3.448***	
	(0.795)	(0.921)	(0.880)	(0.922)	
Observations	3589	3589	3589	3589	
Log-likelihood	-985.03	-983.79	-984.74	-985.13	
McFadden R-sqd	0.06	0.06	0.06	0.06	

Notes:

* significant at 10%; ** significant at 5%; *** significant at 1%

Robust standard errors in parentheses are corrected for clustering of observations at the departmental level. Equations also include dummy variables for graduates where ethnic group, A levels score, social class or neighbourhood HE participation rates are not known.

Table 7: Correlations between sandwich, Old University and employability skills variables

	Sandwich	Old University	Teaching, learning and assessment of employability skills	Work experience provision	Employer involvement in courses
Sandwich	1				
Old University	-0.29	1			
Teaching, learning and assessment of employability skills	0.20	-0.21	1		
Work experience provision	0.41	-0.53	0.31	1	
Employer involvement in courses	0.15	-0.44	0.22	0.65	1

(n=3589)

Table 8: Logistic regressions using graduates' occupational category as dependent variable

	(1)	(2)	(3)	(4)	Odds ratios for coefficients in (4)
Male	0.173*	0.190**	0.179*	0.180*	1.197
	(0.095)	(0.093)	(0.094)	(0.094)	
Age	0.007	0.007	0.007	0.008	
	(0.014)	(0.014)	(0.014)	(0.014)	
Ethnic group	0.042	-0.007	0.044	0.076	
	(0.156)	(0.147)	(0.156)	(0.155)	
A level score	0.009	0.012	0.012	0.018**	
	(0.009)	(0.008)	(0.008)	(0.008)	
Non A level	-0.406***	-0.413***	-0.410***	-0.428***	0.652
	(0.117)	(0.106)	(0.107)	(0.109)	
Degree class	0.412***	0.445***	0.440***	0.433***	1.542
	(0.080)	(0.080)	(0.081)	(0.080)	
Computer studies	1.457***	1.340***	1.470***	1.464***	4.323
	(0.229)	(0.181)	(0.154)	(0.146)	
Business studies	0.699***	0.398*	0.646***	0.631***	1.879
	(0.189)	(0.222)	(0.200)	(0.197)	
History	-0.275	-0.336**	-0.272*	-0.224	
	(0.183)	(0.154)	(0.152)	(0.170)	
Design	0.393	-0.109	0.039	-0.013	
	(0.362)	(0.399)	(0.383)	(0.366)	
Low participation neighbourhood	-0.130	-0.159	-0.151	-0.155	
	(0.104)	(0.105)	(0.105)	(0.105)	
Social class	0.034	0.005	0.010	0.005	
	(0.128)	(0.129)	(0.129)	(0.131)	
Sandwich training placement	0.767***	0.651***	0.690***	0.668***	1.950
	(0.130)	(0.158)	(0.150)	(0.152)	
Old University	0.149	0.256	0.155		
	(0.227)	(0.164)	(0.178)		
Graduate jobs in locality	0.020	0.029***	0.034***	0.036***	1.037
	(0.014)	(0.010)	(0.011)	(0.010)	
Teaching, learning and assessment of employability skills		-0.157	-0.166	-0.156	
		(0.126)	(0.155)	(0.152)	
Work experience provision		0.171*			
		(0.089)			
Employer involvement in courses		0.148	0.252***	0.252***	1.287
		(0.092)	(0.090)	(0.088)	
Constant	-0.635	-1.145***	-1.116**	-1.258**	
	(0.577)	(0.426)	(0.451)	(0.499)	
Observations	3284	3284	3284	3284	
Log-likelihood	-1679.24	-1666.23	-1669.14	-1669.84	
McFadden R-sqd	0.08	0.09	0.09	0.09	

Notes:
* significant at 10%; ** significant at 5%; *** significant at 1%
Robust standard errors in parentheses are corrected for clustering of observations at the departmental level. Equations also include dummy variables for graduates where ethnic group, A levels score, social class or neighbourhood HE participation rates are not known.