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DOES SUBJECT CHOICE IN A JOINT HONOURS DEGREE AFFECT HIGHLY SKILLED GRADUATE EMPLOYMENT?

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Abstract

Joint or combined honours degrees in the UK generally permit students to study two subjects to full bachelors degree depth, by studying half the curriculum content of the respective equivalent single honours degrees. This affords students the opportunity to study a more diverse curriculum that they feel passionate about. However this is at the expense of breadth of study in each particular subject, which is a strong defining feature of the majority of UK single honours degrees. Does the decision to study certain subjects in a joint or combined honours degree affect the graduate's subsequent highly skilled graduate employment? The literature is weak in examining this, either for joint honours subjects generally or for specific combinations of subjects. This paper presents an analysis of the UK Destination of Leavers from Higher Education survey between 2011/12 and 2014/15 at the level of the individual combinations studied – a national dataset which has not previously been critiqued in this particular way in the public domain. This analysis will determine whether certain combinations lend themselves to

higher rates of highly skilled graduate employment, irrespective of other factors affecting employment, for example the characteristics of different universities. We conclude that subject choice greatly affects graduate employment, and we present recommendations around the preparedness or otherwise of graduates for highly skilled graduate employment, as determined by their choice of subjects to study.

Keywords

Joint Honours Degree, Combined Honours Degree, Graduate Employment, Careers

1. Introduction

According to UCAS (2017) tuition fees for university degree courses starting in September 2017 in England will cost up to £9,250 per year. However there is substantial variation within the other nations of the UK: Welsh and EU students studying at a Welsh university pay up to £4,046 per year, while Scottish and EU students, studying in Scotland, pay no tuition fees. Meanwhile Northern Ireland and EU students pay up to £3,925 per year within Northern Ireland. Generally students from within the UK but from a different region will pay considerably more than home region and EU students.

Within a particular region of the UK there is very little variation in the tuition fees for different university degrees. According to the Reddin Survey of University Tuition Fees 2016-17 (Reddin, 2017), undergraduate standard home and EU fees for most English universities were the full £9,000, with only a handful of universities charging less for certain courses: Chichester, London Metropolitan and Sunderland. When the maximum tuition fee was nearly trebled in 2012 to its current level, one policy intention, according to the Browne Report (2010), was to increase competition and fee variation within the higher education sector. Ministers assumed that universities would charge different levels of fees, estimating they would be on average £7,500 across the sector (BIS, 2010). It was envisaged that universities would charge mainly £6,000 per year for a degree, and up to £9,000 where they could demonstrate a commitment to widening participation and fair access (Gov.uk, 2010). However even in the first year of implementation, the average tuition fee was around £8,400, and it has increased each year since then, to just under £8,900 in 2016/17 (Bolton, 2016).

With students unable to discriminate in their choice of university by price, many have looked at the likelihood of a particular institution to improve their employment – after league table position, this is the most important factor in choosing a university (McManus et al, 2017).

Furthermore, many students are keenly interested in studying a particular degree course leading to a specific career with good levels of highly skilled graduate employment (Kandiko, 2013). It is certainly the case that some careers with high levels of highly skilled graduate employment require a particular degree, for example engineering, medicine, nursing, dentistry, science and veterinary science. However many careers can be accessed by graduates from any degree discipline, although some industries do require further, work-based study, relevant work experience or a related degree. For example sales, banking, management consulting, accountancy, hospitality and travel management.

Employers are consistently interested in both the classification of the degree achieved, with many requiring at least a 2.1, and increasingly they are looking at the ranking of the institution, with Russell Group graduates typically in high demand (CBI, 2015). For a student presented with a wide range of degree courses to choose from, this suggests that they would firstly be wise to select a degree course that they will really enjoy, and they will therefore be more likely to stay engaged, achieve the best degree of which they are capable and hopefully the 2.1 degree classification required to access many graduate positions. Secondly, the reputation of the university is likely to have a bearing on the graduate's future career success, and so this is an important criterion in degree choice.

Employers are also keen to employ graduates who can evidence they have done more than just study for their degree, even if this is at a top-ranked university (Tomlinson, 2017). Graduates will need to be able to demonstrate engagement with extra-curricular activities, work experience and will therefore have developed their softer graduate attributes, specifically around communication skills, time management, team working and business acumen.

The focus of this study is the joint honours degree graduate in the UK. Around 10% of students in the UK (UCAS, 2016) elect to study a joint honours degree, studying two subjects to full honours degree depth, rather than the more usual single honours degree. For these students the same principles around choice of vocational versus non-vocational subjects apply, but now there is the added complication that two subjects are involved. Do certain subjects, when studied as a joint honours degree, improve the employment of the graduate, or indeed worsen it? Are certain combinations of subjects greater than the sum of the parts, i.e. in enhancing career prospects in comparison to the individual subjects when studied as a single honours degrees?

Nationally, students who have graduated from a joint honours degree have a 3% point negative gap in the proportion within highly skilled destinations six months after graduating, compared with those who have studied a single honours degree (Pigden & Moore, 2017). However this national averaging masks substantial variation between nations of the UK and also between Russell Group and post-92 institutions. On average, joint honours graduates from Russell Group universities are highly employable compared with the national average. However joint honours graduates from post-92 institutions are less likely to be in highly skilled destinations six months after graduating compared with single honours graduates from the same group of universities.

This study analysed a different aspect of the joint honours degree, namely the subjects studied and in what combination; we evaluated whether certain subjects and particular combinations were correlated with improved highly skilled destinations. The hypothesis we wished to explore was whether the subjects studied, and in what combination, should be part of the decision-making process for students deciding what degree to study at university, if securing highly skilled destinations were a key driver.

2. This study: Does subject choice in a joint honours degree affect highly skilled graduate employment?

2.1 Aims

A number of recent studies (Webber 2014; Walker and Zhu 2011; Dale and Krueger 2014) have found variation in highly skilled graduate career prospects across a range of different factors, including the subject and classification of degree and the type of university. However these analyses usually assume the graduates have studied a single honours degree. Our study considered joint honours graduates; we sought to analyse whether the specific subjects studied by graduates who had completed a joint honours degree had an impact on their graduate outcomes six months after graduation. We established this by analysing the Higher Education Statistics Agency (HESA) UK Destination of Leavers from Higher Education (DLHE) survey data between 2011/12 to 2014/15. Our study specifically considered the outcomes of full-time undergraduates in the UK.

2.2 Objectives

The objectives of the study were to first identify the joint honours graduates in the complete dataset provided from the HESA DLHE survey. The data was then analysed to

establish whether there was a difference in highly skilled graduate employment depending on the choice of subjects studied, and in what combination. We wanted to explore whether certain subjects or combinations of subjects resulted in better rates of highly skilled destinations, compared with single honours graduates who had studied those subjects.

The study did not take into account factors such as the type of university, the region within the UK (see Pigden & Moore, 2017) or any personal characteristics of the graduates. As such, our study was constrained to demonstrating any correlation for this particular aspect: the subjects and combinations studied as part of a joint honours degree and highly skilled destinations.

2.3 Methodology

The Joint Academic Coding System (JACS) is a way of classifying academic subjects, with the latest version JACS 3.0 coming into effect in 2012/13, according to HESA (2017 b). The system is co-owned and maintained by HESA and the Universities and Colleges Admissions Service (UCAS). The dataset in our study comprised the DLHE survey data from 2011/12 to 2014/15 inclusive, and the bespoke dataset acquired by the authors from HESA crucially included up to three JACS principal subjects studied by the graduate; this provided the lever with which to identify joint honours degrees and to analyse them as a separate dataset.

In our study, where a degree mapped onto just one JACS principal subject, this was deemed a single honours degree. Joint honours degrees were therefore defined as being where the graduate had studied two or three principal subjects that mapped to more than one JACS subject area. For example, 'History and Mathematics', with principal subjects V1 and G1 respectively, mapped to two different JACS subject areas V and G, and was considered a joint honours degree. In contrast, 'Physics and Astronomy', with principal subjects F3 and F5 respectively, was considered a single honours degree as both principal subjects were contained within the same JACS subject area, F. This approach was simple, algorithmic and ensured that the joint honours degrees in our dataset were those that only featured two or three different subjects taught in different academic disciplines.

It may be argued that this approach excluded some 'genuine' joint honours degree combinations that occurred where pairs of subjects were studied from the same JACS subject area. For example, the biological sciences subject area contained biology, sport and psychology (HESA, 2017 c), and the languages subject area contained combinations of foreign languages.

Moreover the social studies subject area contained a range of quite diverse subjects: economics, politics, sociology and human geography. Lastly the historical and philosophical studies subject area contained history, philosophy, theology and archaeology. However to include combinations from within a single subject area would have required a manual review of degree titles and a subjective interpretation of what constituted a joint honours degree. For example, while it may have seemed appropriate to exclude ‘Accounting and Finance’, it might have been less clear as to whether ‘Management and Marketing’ should have been included as a joint honours degree.

An alternative method considered was to take the set of subjects studied as single honours degrees and then define a joint honours degree as comprising an award that included two or three from this list. This would have avoided the difficulties encountered in deciding whether to include certain combinations from within a particular subject area. Using this methodology, ‘Economics and Politics’ would have been included, but ‘Film and Media’ would not. The challenge for this method lay in the quality of the data provided by the HESA DLHE survey. The textual degree title was not provided in a uniform or consistent format, for example the data included such degree titles as ‘History + W Hist’, ‘Biol & Spt Sci’, ‘Geog/Econ’, and so this approach would have required a manual parse through the data to resolve these idiosyncrasies. Given the size of the dataset a manual intervention may have introduced errors and so was ruled out at this stage of the research.

In order that our study complemented the recent assessment of UK universities under the Teaching Excellence Framework (TEF) (Higher Education Funding Council for England (HEFCE), 2017) we used the same criteria for highly skilled destinations or further study as defined by HEFCE, namely that the definition of highly skilled destinations was any occupation within categories 1-3 of the Standard Occupational Classification (Office for National Statistics 2010). All further study was also considered to be highly skilled and was therefore included wherever highly skilled destinations were referred to.

To produce a fair and comparative analysis between single and joint honours degrees, we excluded subjects that were not offered as part of a joint honours degree at any university. The complete list of excluded subjects can be found in Table 1. The four-year dataset, 2011/12 – 2014/15, was combined to give the largest number of data points to analyse, and also to smooth out any fluctuations within a particular year.

Table 1: *Subjects removed from the Analysis as they were not part of Joint Honours Degrees at any University*

JACS Code	JACS Principal Subject
A1	Pre-clinical Medicine
A2	Pre-clinical Dentistry
A9	Others in Medicine and Dentistry
B5	Ophthalmics
G02	Broadly based programmes in computer science (2011/12 only)
D1	Pre-clinical Veterinary Medicine
D2	Clinical Veterinary Medicine & Dentistry
D9	Others in Vet Sci,Ag & related subjects
H9	Others in Engineering
I5	Health Informatics
J1	Minerals Technology
K0	Architecture,Build & Plan: any area
K9	Others in Architecture,Build & Plan
W0	Creative Arts & Design: any area
A3	Clinical Medicine
A4	Clinical dentistry

2.4 Results and Analysis

2.4.1 Percentage in Highly Skilled Destinations by Subject Studied

Table 2 presents the percentage of graduates in highly skilled destinations, six months after graduating, by subject studied, where ‘subject’ is the related JACS Principal Subject. Subjects were only included where there were more than 500 single and 500 joint honours graduates, when summed over 2011/12-2014/15, i.e. both samples exceeded 500 graduates. The percentage in highly skilled destinations was calculated for single honours graduates, for joint honours graduates who studied that subject, and then the total of single and joint honours graduates combined. The percentage of graduates who studied a particular subject as part of a joint honours degree was included, as was the percentage point difference in the highly skilled destinations rate between the single and joint honours graduates. Indeed, the table was sorted on this value, to see at a glance where a particular subject, when studied as part of a joint honours degree, resulted in

a higher or lower highly skilled destinations rate compared with when studied alone as a single honours degree.

Table 2: Percentage in Highly Skilled Destinations by Subject Studied, Summed Over 2011/12 – 2014/15

	Single	Joint	Total		
JACS Principal Subject	Percentage in Highly Skilled Destinations	Percentage in Highly Skilled Destinations	Percentage in Highly Skilled Destinations	Percentage of Joint Honours Graduates	Difference Between Single and Joint (% Points)
Others in Subjects allied to Medicine	73.6%	54.7%	70.3%	17.3%	19
Pharmacology, Toxicology and Pharmacy	92.6%	74.8%	91.7%	5.1%	18
Social Work	70.5%	55.0%	69.1%	8.9%	16
Law by Topic	72.4%	59.9%	70.5%	15.5%	12
Anatomy, Physiology and Pathology	82.5%	70.2%	81.2%	10.7%	12
Law by Area	74.3%	67.3%	73.1%	17.0%	7
Information Systems	68.2%	62.0%	67.4%	13.6%	6
Theology and Religious studies	69.9%	64.6%	69.1%	15.2%	5
Journalism	58.4%	55.1%	57.8%	16.5%	3
English studies	61.7%	58.5%	60.5%	35.6%	3
Training Teachers	90.9%	87.9%	90.6%	9.6%	3
General Engineering	82.9%	80.3%	82.5%	17.0%	3
Psychology	56.2%	53.9%	55.8%	20.2%	2
Cinematics and Photography	50.2%	48.0%	49.9%	12.9%	2
Electronic and Electrical Engineering	75.2%	73.0%	74.9%	13.8%	2
Social Policy	55.0%	53.0%	54.4%	29.1%	2
Media studies	49.9%	47.9%	49.4%	26.7%	2
Music	63.9%	61.9%	63.6%	12.5%	2
Marketing	65.7%	64.4%	65.6%	12.7%	1
Agriculture	57.1%	55.8%	56.8%	18.5%	1
Spanish studies	71.2%	70.0%	70.7%	39.8%	1
Chemistry	78.1%	77.0%	78.0%	13.8%	1

Forensic and Archaeological Science	54.1%	53.3%	53.9%	21.5%	1
Computer Science	73.7%	73.1%	73.6%	10.4%	1
Linguistics	61.0%	60.5%	60.9%	27.6%	1
Publicity studies	66.0%	65.5%	65.9%	34.2%	0
German studies	73.4%	73.0%	73.3%	36.5%	0
Planning (Urban, Rural and Regional)	78.7%	78.3%	78.6%	20.4%	0
Economics	76.3%	76.2%	76.3%	32.6%	0
Molecular Biology, Biophysics & Biochem	72.8%	72.9%	72.8%	9.6%	-0
Physics	79.8%	80.1%	79.8%	13.9%	-0
History by Topic	64.7%	65.3%	64.8%	25.2%	-1
Mathematics	76.0%	76.8%	76.2%	24.9%	-1
Design studies	60.0%	61.2%	60.1%	6.9%	-1
Politics	67.5%	68.9%	68.1%	41.0%	-1
French studies	71.3%	73.0%	72.0%	42.0%	-2
Physical Geographical Sciences	63.1%	65.5%	63.4%	13.2%	-2
Human and Social Geography	68.4%	71.0%	69.0%	23.5%	-3
Sociology	49.0%	51.6%	49.7%	29.7%	-3
Academic studies in Education	53.2%	55.9%	53.7%	19.8%	-3
History by Period	60.2%	62.9%	61.0%	29.2%	-3
Classical studies	65.9%	69.0%	66.8%	29.0%	-3
Others in Law	44.7%	48.3%	46.4%	46.1%	-4
Others in European Langs, Lit and related	67.0%	70.7%	68.7%	45.5%	-4
Drama	51.8%	55.7%	52.4%	14.2%	-4
Management studies	64.9%	68.8%	65.7%	21.0%	-4
Hospitality, leisure, sport, tourism & transport	50.3%	54.4%	50.6%	8.0%	-4
History by Area	57.7%	62.3%	60.0%	48.5%	-5
Nutrition	69.1%	74.0%	70.0%	17.8%	-5
Sport and Exercise Science	62.3%	67.7%	63.1%	13.1%	-5
American studies	56.4%	62.3%	60.2%	64.1%	-6

Biology	63.4%	69.6%	64.2%	13.9%	-6
Anthropology	56.3%	62.6%	58.3%	32.7%	-6
Archaeology	61.0%	68.3%	63.1%	28.1%	-7
Finance	64.6%	72.6%	66.1%	18.3%	-8
Others in Technology	55.8%	63.8%	57.5%	20.6%	-8
Business studies	60.0%	68.1%	61.5%	17.9%	-8
Imaginative Writing	42.8%	51.0%	47.7%	60.2%	-8
Accounting	61.8%	70.5%	62.3%	5.9%	-9
Philosophy	61.9%	71.0%	66.6%	51.2%	-9
Others in Biological Sciences	66.6%	78.7%	68.3%	14.3%	-12

Figure 1 shows the correlation between the percentage of graduates who had studied a particular subject as a joint honours degree rather than as a single honours degree, and the percentage difference between the highly skilled destinations of both cohorts for that subject.

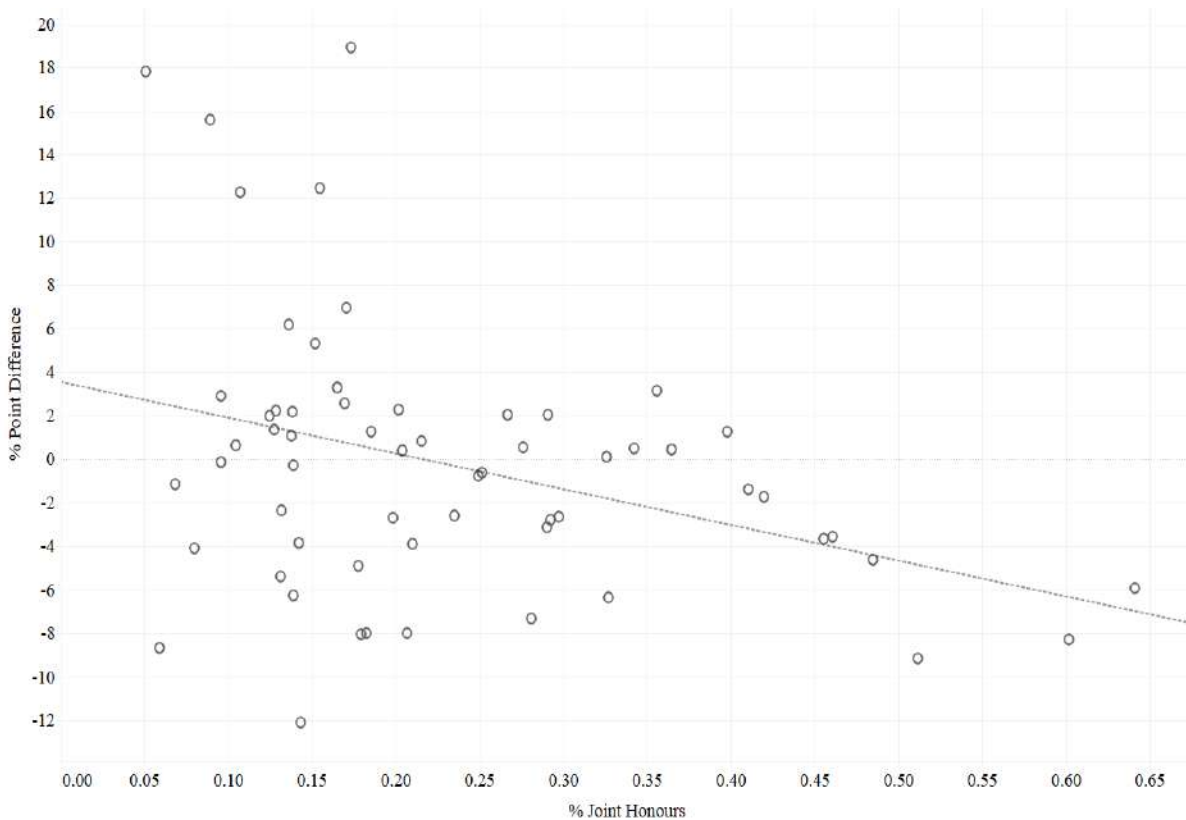


Figure 1: *Correlations between the Percentage Studying a Joint Honours Subject and the Percentage Difference in Single Honours to Joint Honours Employment*

Table 3 shows that there is a weak negative correlation ($p < 0.01$) i.e. the more a subject was taken

as a joint honours degree, the better the performance of the joint honours graduates compared with the single honours graduates who had studied that subject.

Table 3: *Significance of the Correlations between the Percentage Studying a Joint Honours Subject and the Percentage Difference in Single Honours to Joint Honours Employment*

Correlation		Percent Joint Hons	Percent Difference
Percent Joint Honours	Pearson Correlation	1	-.354**
	Sig. (2-tailed)		.005
	N	61	61
Percent Difference	Pearson Correlation	-.354**	1
	Sig. (2-tailed)	.005	
	N	61	61

** . Correlation is significant at the 0.01 level (2-tailed).

There were five JACS principal subjects where the percentage point difference in highly skilled destinations between the single and joint honours graduates was greater than 10% points, summarised in Table 4, i.e. where the single honours graduates were substantially more likely to be in a highly skilled destination compared with the joint honours graduates who had studied that subject.

Table 4: *Greatest Positive Percentage Point Difference in Single Honours Graduates in Highly Skilled Destinations compared with Joint Honours Graduates*

JACS Principal Subject	Difference Single - Joint (% points)
Others in Subjects allied to Medicine	19
Pharmacology, Toxicology and Pharmacy	18
Social Work	16
Law by Topic	12
Anatomy, Physiology and Pathology	12

The top subject, ‘Others in Subjects Allied to Medicine’, also had a high proportion of graduates who studied the subject as part of a joint honours degree, at 17.3%. Degrees including this principal subject included counselling, public health and health science. ‘Law by Topic’ also had a high proportion of joint honours graduates, at 15.5%. Degrees including this principal subject included business, maritime, international and commercial law and policing. We knew from our previous work (Pigden & Moore, 2017) that joint honours graduates of Russell Group universities, for example, were significantly more likely to find highly skilled destinations than

those from post-92 institutions. Without including the university and other factors therefore, we can only conclude that the employment gap is correlated with subject studied, rather than demonstrating a causal link. However this could be considered an appropriate factor to include when deciding the choice of degree if highly skilled destinations were the primary goal.

At the other end of the dataset, summarised in Table 5, we could identify the subjects where the joint honours graduates were more likely to be in highly skilled destinations than those that had studied the subject as a single honours degree. ‘Others in Biological Sciences’ predominantly included variations of biomedical science. Graduates who had studied this as part of a joint honours degree were 12% points more likely to be in highly skilled destinations, than those who had studied the subject as a single honours degree. It was notable that both philosophy and imaginative writing were respectively 9% points and 8% points more likely to be in highly skilled destinations as joint honours graduates than single honours. These subjects had a very high proportion of joint honours graduates, respectively 51.2% and 60.2%.

Table 5: *Greatest Negative Percentage Point difference in Single Honours Graduates in Highly Skilled Destinations Compared with Joint Honours Graduates*

JACS Principal Subject	Difference Single - Joint (% points)
Finance	-8
Others in Technology	-8
Business studies	-8
Imaginative Writing	-8
Accounting	-9
Philosophy	-9
Others in Biological Sciences	-12

The subjects that had the highest proportion of joint honours graduates, over 40%, Table 6, were all positively correlated with highly skilled destinations compared with the single honours graduates, although in the case of ‘Others in Law’ and ‘Imaginative Writing’ these were particularly low rates at 48.3% and 51.0% respectively. The percentage in highly skilled destinations amongst these joint honours graduates was highly diverse, ranging from 72.0% to 46.4%.

Table 6: *Percentage Point Difference in Single Honours Graduates in Highly Skilled Destinations Compared with Joint Honours Graduates, for the Subjects having the Greatest Proportion of Joint Honours Graduates*

JACS Principal Subject	% Joint honours	Difference Single - Joint (% points)
Politics	41.0%	-1
French studies	42.0%	-2
Others in Law	46.1%	-4
Others in European Langs,Lit and related	45.5%	-4
History by Area	48.5%	-5
American studies	64.1%	-6
Imaginative Writing	60.2%	-8
Philosophy	51.2%	-9

The subjects with the lowest proportion of joint honours graduates, under 10%, Table 7, the national average for joint honours degrees (UCAS, 2016), had a mix of positive and negative correlations with highly skilled destinations compared with the single honours graduates. The overall percentage in highly skilled destinations amongst this group was diverse, ranging from 91.7% to 50.6%, however the values were notably, though not statistically significantly, higher overall than the subjects with the highest proportion of joint honours graduates.

Table 7: *Percentage Point Difference in Single Honours Graduates in Highly Skilled Destinations Compared with Joint Honours Graduates, for the Subjects having the Smallest Proportion of Joint Honours Graduates*

JACS Principal Subject	% Joint honours	Difference Single - Joint (% points)
Pharmacology,Toxicology and Pharmacy	5.1%	18
Social Work	8.9%	16
Training Teachers	9.6%	3
Molecular Biology,Biophysics & Biochem	9.6%	-0
Design studies	6.9%	-1
Hospitality, leisure, sport, tourism & transport	8.0%	-4
Accounting	5.9%	-9

2.4.2 The Effect on Highly Skilled Destinations of Studying Subjects in Certain Combinations

In order to analyse the effect of studying certain subject combinations on highly skilled destinations, it was necessary to aggregate the subjects into five high level groupings. This was because the number of different joint honours combinations of subjects was so large. The groupings we designed were:

- Arts and Humanities
- Business and Law
- Education
- Mathematics, Engineering and Technology
- Science

These groupings did not derive from an official or published categorisation, since there was no abstraction of subject at a higher level than the JACS subject areas. Therefore the rationale for these particular groupings could be a matter for debate. Likewise, the allocation of particular subjects to a group could be disputed; for example, sociology was included in Arts and Humanities as was complementary medicine. However the groupings did permit a simple analysis of whether certain combinations correlated more favourably with highly skilled destinations, and we believed the majority of the allocation of subjects to a group was non-contentious.

We first replicated the analysis of Table 2 and calculated the percentage of graduates in highly skilled destinations by subject studied, summed over 2011/12 – 2014/15, and with the subjects aggregated into the appropriate groupings. Table 8 shows the results and we saw that there was once again a range of percentage point difference in the highly skilled destinations rate between the single and joint honours graduates. The range of difference was smaller in this analysis, with the extremes having been averaged out by the aggregation of subjects into groupings. It was interesting to observe that the grouping with the largest proportion of joint honours graduates, Arts and Humanities, was also the only grouping where the joint honours graduates were more likely to be in a highly skilled destination than the single honours graduates. At the other end of the table, the Science grouping showed a 9% point advantage in highly skilled destinations amongst single honours graduates compared with joint honours graduates.

Table 8: *Percentage in Highly Skilled Destinations by Groupings of Subject Studied, Summed over 2011/12 – 2014/15*

	Single	Joint	Total		
Subject Grouping	Percentage in Highly Skilled Destinations	Percentage in Highly Skilled Destinations	Percentage in Highly Skilled Destinations	Percentage of Joint Honours Graduates	Difference Between Single and Joint (% Points)
Science	73.1%	64.0%	72.2%	10.0%	9
Education	73.7%	66.4%	72.6%	15.1%	7
Maths, Engineering & Technology	76.2%	73.2%	75.8%	11.5%	3
Business & Law	62.2%	61.9%	62.1%	16.9%	0
Arts & Humanities	61.0%	62.9%	61.4%	20.7%	-2

We then analysed combinations of subjects, using these high level groupings. Table 9 shows the proportion of graduates in highly skilled destinations against the combination of subjects studied. The combinations were included in the table only where the proportion of graduates in that particular combination contributed 2% or more to the percentage of all joint honours graduates.

Table 9: *The Proportion of Graduates in Highly Skilled Destinations against the Combination of Subjects Studied*

Combination Type	Proportion In Highly Skilled Destination	Proportion Of All Joint Honours Degrees
Maths, Engineering & Technology - Science	75%	3%
Business & Law - Maths, Engineering & Technology	71%	4%
Arts & Humanities - Maths, Engineering & Technology	70%	6%
Within Science	69%	6%
Education - Science	68%	2%

Within Business & Law	66%	4%
Arts & Humanities - Education	65%	5%
Within Arts & Humanities	64%	30%
Arts & Humanities - Science	61%	12%
Arts & Humanities - Business & Law	60%	21%
Business & Law - Science	57%	4%

There was a cluster of combinations at the lower end of the range for highly skilled destinations that corresponded to the three dominant joint honours subject pairings: Within Arts and Humanities; Arts and Humanities / Business and Law; Arts and Humanities / Science. However there were too few data points to calculate any statistical significance to this observation. Notwithstanding that, it was noted that the percentage in highly skilled destinations for these popular combinations was at or below the national average of 64.4% for all joint honours graduates (Pigden & Moore, 2017).

Although contributing a smaller proportion to the overall joint honours graduates, combinations including Mathematics, Engineering and Technology all clustered at the top of the table, i.e. these had the highest proportion of highly skilled destinations. Again, there was no statistical significance to this observation, however this level of highly skilled destinations ranked comfortably above the national average of 64.4% for all joint honours graduates (Pigden & Moore, 2017). Indeed these levels of highly skilled destinations compared favourably with the levels found in Russell Group (75.03%) or non-post 92 (70.57%) joint honours graduates (Pigden & Moore, 2017).

Reflecting on both Table 8 and Table 9 combined; certain combinations resulted in a higher level of highly skilled destinations than the average for the joint honours graduates in a particular grouping. These were:

For Science combining with:

- Mathematics, Engineering and Technology
- Science
- Education

For Education combining with:

- Science

For Mathematics, Engineering and Technology combining with:

- Science

For Business and Law combining with:

- Mathematics, Engineering and Technology
- Business and Law

For Arts and Humanities combining with:

- Mathematics, Engineering and Technology
- Education
- Arts and Humanities

Of these, certain ‘super combinations’ resulted in higher highly skilled destinations than the averages for either of the groupings making up the combination:

- Mathematics, Engineering and Technology - Science
- Science – Science
- Education – Science
- Business and Law - Business and Law
- Arts and Humanities - Arts and Humanities

The following combinations resulted in lower highly skilled destinations than the averages for either of the groupings making up the combination:

- Arts and Humanities – Science
- Arts and Humanities – Business and Law
- Business and Law – Science

This analysis suggested that certain pairings of joint honours subjects did positively or negatively affect the proportion of graduates in highly skilled destinations and might usefully be included in the degree decision-making process for prospective students, if career outcomes are a strong motivating factor post-graduation.

3. Conclusion

Based on the definition of a joint honours degree in this study, namely that a graduate had studied two or three principal subjects from different JACS subject areas, we found that there

was a difference between the highly skilled destinations rates of the single honours graduates compared with the joint honours graduates, depending on the subject studied. This difference ranged from +19% points for ‘Others in Subjects Allied to Medicine’ through to -12% points for ‘Others in Biological Sciences’.

Our DLHE national dataset was summed over four years, 2011/12-2014/15, and so masked variations within the data, for example due to the type of university (Russell Group, post-92), or region within the UK (England, Wales, Scotland, Northern Ireland). We knew from previous work (Pigden & Moore, 2017) that these factors also affect highly skilled destinations rates in joint honours graduates.

In an attempt to explore whether particular combinations of subjects in a joint honours degree correlated with employment outcomes, we aggregated the subjects into high level groupings and analysed the proportion in highly skilled destinations. We found that combinations that included a Mathematics, Engineering and Technology subject were clustered with the highest level of employment outcomes. Furthermore, the most popular joint honours combinations were clustered at the lower end of employment outcomes. No statistical significance could be calculated for these observations.

We also identified that certain combinations resulted in higher levels of highly skilled destinations than the averages for either of the two respective groupings – the whole was greater than the sum of the parts. The converse was also found – some combinations resulted in lower levels of highly skilled destinations than for either of the respective groupings comprising the combination.

To conclude, our investigation demonstrated that certain subjects, when studied as a single honours degree rather than a joint honours degree, resulted in higher levels of highly skilled destinations. The converse was also true. Furthermore, certain combinations of subjects resulted in higher levels of highly skilled destinations than other combinations. Lastly that certain combinations resulted in higher levels of highly skilled destinations than either of the constituent parts, and conversely so. All of these observations should be factored into an overall decision making process around choice of degree, if achieving a highly skilled destination is of primary or high concern.

These factors should also be acknowledged and acted upon by university leaders as they implement strategies for achieving high levels of graduate success for all their students. Our

analysis demonstrated that while there was no systemic or inherent weakness across all joint honours degrees, however proactive employment interventions may be helpful for some students to ensure their future career success.

4. Future Work

This study focussed on joint honours degrees where the two or three principal subjects fell into different JACS subject areas, i.e. the two or three subjects were necessarily diverse rather than academically cognate. Future work will consider the class of joint honours degrees where the principal subjects lie within the same JACS subject area, i.e. they may be closer academically, although still taught by different academic teams. This grouping will include, for example, pairs of foreign languages, some social sciences pairings such as politics and sociology, and pairings such as history and theology from the historical and philosophical subject area. These are popular degrees, and so it is important to evaluate their correlation or otherwise with highly skilled destinations.

Furthermore, by including other metrics and published data, along with this proposed further quantitative analysis of the DLHE data, we will seek to explore and explain some of the differences identified in this study. For example, by including National Student Survey (NSS) data around institutional student satisfaction, teaching quality and assessment and feedback, can we begin to better understand the factors and environment that influence highly skilled destinations? We will focus on the Teaching Excellence Framework (TEF) metrics when these are confirmed for the subject-level TEF, in order to complement that assessment.

Other quantitative metrics might include the characteristics of the students at particular institutions in terms of gender, age, ethnicity, disability and social mobility. More qualitatively, does an institution's approach to the operational delivery of its joint honours degrees affect the graduates' employment outcomes, for example centralised versus devolved administrative and academic management.

The format of the DLHE survey is changing in 2017; in addition to familiar questions from the current destinations survey, 'NewDLHE' (HESA, 2017) asks new questions to provide a richer picture of the diversity of graduate outcomes and to redefine how we understand graduate success. These new 'graduate voice' measures capture three areas:

- Meaningfulness or importance of the activity to the graduate
- Skills utilisation

- The graduate's progress towards future goals.

It will be vital to take NewDLHE into account in the design of future work, and there should be opportunities to explore the application of the unique graduate attributes acquired in studying for a joint honours degree, applied to the graduates' careers.

Ultimately, the over-arching goal of the research will be to provide institutions with observations and recommendations that may assist them in providing joint honours degrees that lead to excellent graduate outcomes, and in closing the national average highly skilled destinations gap between the single honours and joint honours graduates.

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