Placements and degree performance: Do placements lead to better marks, or do better students choose placements?

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Abstract

There has been a strong move recently to make degrees more applicable to employment; including work placements as part of the programme is one way of achieving this. Such placements are advocated to increase employability, but also for improving academic performance. This paper examines the relationship between undertaking a work placement and the class of degree achieved. It challenges earlier findings that undertaking a placement increases degree results. Studying seven cohorts of students, a well tested approach was employed that allows for sample selection – i.e. whether better students do placements rather than whether placements produce better students. The paper concludes that the sample selection is much stronger, i.e. placement students do better because they are better students. The results highlight that it is not merely doing a placement that matters, but a successful placement adds significantly to subsequent performance. The paper concludes with advice to students and policy makers.

Key words: Employment, Degree classification, Non-Traditional Students, Business Education, Student Success

Introduction

Over recent years there has been a strong move to make UK degrees more applicable to the world of work and to include work placements as an integral part of a degree programme is one way of achieving this. Many universities, particularly in professional and professionally-related disciplines, have incorporated such kinds of work experience for some years, although there is evidence of a decline in placements (Little and Harvey 2007, Blake and Summers 2007). More recently the work placement has again been under scrutiny in the UK as such activity becomes central to government policies (Higher Ambitions 2009).

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Studies suggest that there is a causal link between improvement in employability and academic achievement after completing an integrated work placement (Arnold and Garland 1990). There are two main assumptions about the efficacy of such work experience. The first is that placements make you more employable. The second is that placements improve the final quality (class) of degree. Evidence to support the former premise has been actively researched and the case has been strongly supported by a number of studies (e.g. Hadfield 2007 and Phillips 2007). This paper seeks to find out whether the second assumption can also be supported by carrying out a longitudinal statistical analysis of students who did or who did not take a work placement as part of their degree. For the purposes of this paper, placements have been defined as what has been traditionally classed as a "sandwich year" – a year-long integrated period of work experience which is undertaken by students at many UK universities as part of their degree (often between the second and final year). The research seeks to probe the assumptions of previous studies by taking into account an increased number of variables.

The degree structure in most UK universities, with the exception of Scotland, is based on a credit system where a level of study has a value of 120 credits and a typical honours degree will be made up of 360 credits. The levels of study for HE are as follows: level 4, first level of study in HE, equates to a Certificate in Higher Education; level 5 is the second level of study in HE and level 6 is the third level of study, Bachelor degrees, level 7 is Masters degrees and level 8 is doctoral degrees (direct.gov.uk).

Literature Review

The work placement or internship is a characteristic of contemporary higher education which is focussed towards improving the development of students' employability and transferable skills. Placements originated 50 years ago: 'the National Council for Industry and Commerce characterised the sandwich principle as being founded upon 'an interaction of academic study and practical applications such that each serves to illuminate and stimulate the other' (Brennan and Little 1996, page 4). Harmer (2009) suggests that learning and teaching would be enhanced for all stakeholders if every student experienced the real-life complexities of organisations as part of their degree. Many previous studies look at how effective such placements are in developing career-related competencies (e.g. Murakami et al. 2009). Auburn (2007) looks at the skills acquired on placement in relation to students' final year studies once they return to complete their degree. He identifies a range of knowledge areas, skills or values acquired from the placement year which can be deployed in the final year. He suggests that there is little connection between the placement experience and the academic one.

Over the years there have been a number of attempts to gauge how effective a work placement is in improving academic performance (e.g. Lavinal, Decure and Blois 2007; Bennett et al. 2008; Morse 2006; Duignan 2003 and 2003, HEFCE 2009). Little and Harvey (2007) add to the research on the effect of placements on academic performance, but from the student perspective. The majority of undergraduates in their study indicate that they gained personal and intellectual development and report increased levels of confidence and enhanced motivation towards study. Similar themes are taken up by Crebert et al. (2004) in a study which also looks at the student perspective. A HEFCE (2009) analysis of student characteristics relating to whether they had or had not taken a placement shows that those who undertook a placement had different characteristics from those who had not taken a placement, for example those who did were more likely to be male and from higher socio-economic classes (1-3).

Blackwell et al. (2001) seek to assess the effect of placements both on academic performance and employment rates. Their conclusion is that placements are more likely to be successful where the higher education institution consistently encourages students to reflect on their learning. This once again explores the link between university studies and placements, as well as hinting at the extra gains which effective learning brings. Ellis (2000), Huntingdon et al. (1999) and Webber (2005) also stress the need for careful management of work placement programmes, including the preparation of students, which may relate to what marks out the 'better' students as discussed in this study. Maybe it is their ability to learn in a certain way. Schaafsma (1996) and Leslie (1999) take a critical view of the claims made for the added value of placements. The former examines the work placement as a site for "contested learnings" and suggests that work-based trainers and educators need to make use of these learnings to ensure they add value to students' understanding of their work placements in context. The latter also makes proposals to address his view that the benefits often attributed to work experiences are not always realised. Bourner and Ellerker (1998) identify that the main solution to ensuring the effectiveness of the work placement is to ensure as much integration as possible between the placement and academic studies, rather than examining the students who undertake them.

Scoping the research framework and questions

There are a number of studies which use statistical methodologies to look at the issue of student academic performance after undertaking a placement. In order to shape research questions and inform the methodology for this current research, we have reviewed this literature in detail. The main research questions which emerge for closer examination are set out below.

Research Question 1: **Does undertaking an integrated work placement improve your degree classification?** Duignan (2002) concludes that: 'No significant difference was found between those who undertook a placement and those who did not.' (p.214) His survey is a statistical analysis of examination results, relating to two cohorts of business undergraduates. Some of them had done a placement and others had not. Our study has chosen to concentrate on a similar student population. The main issue with Duignan (2002) is that it does not control for the essential problem in these types of studies, which is whether ability and placement decision are correlated, and if they are, how does one control for this. In addition, Duignan (2002) further acknowledges that several factors that may be considered to impact on student performance were either not captured within his dataset, or where they were, the ones associated with poor performance were disproportionately experienced by, the placement cohort (family illness, bereavement, income problems etc)' (p.217). Consequently, in this study a data set with a far greater number of variables were investigated. This highlights a problem with this type of analysis when working with relatively small samples, and as such the data set and methodology in Duignan's two studies seem to lead him to somewhat contradictory conclusions.

Other literature suggests that a placement does improve degree classification. Gomez et al. (2004), anecdotally 'find that students on their optional bioscience sandwich degrees benefit academically from placement experience but there is little supportive evidence of this in the literature.' (p.373) They investigate this using multiple regression analysis, and conclude 'that students taking a sandwich placement exhibit improved academic performance in the final year - on average, placement students gain an advantage of 4%.' (p.378) The current study builds on this premise, and Gomez et al.'s belief that ' …a certain degree of caution must be exercised in concluding a straightforward causal effect of placement on academic performance.' (p.381) Once again their lack of depth of statistical analysis leads to a somewhat anecdotal approach.

Mandilaras (2004) surveyed economics students studying on a degree which had an optional placement year. Results were that participation in the placement scheme significantly increases the chances of obtaining a higher class of degree. 'The obtained results indicate that opting to do the placement increased the likelihood of an upper-second-class degree by 30%. The probability of obtaining a lower second is also lower for a student who has been on industrial placement. The probability of a lower second is 69% for a non-placement student compared to 39% for a placement student.' (p.47) Once again this study does not find or attempt to explore other variables which would account for this increase in performance:

Research Question 2: Do the 'better' students go on placement?
Gomez et al. (2004) could not find evidence to answer this question, saying that 'With the relative paucity of studies providing evidence for the academic benefits of placement and the consequent reliance on anecdotal observation, it has been difficult to determine the validity of the following supposition "that it is the more academically-gifted students that go on placements" (p.380).
If 'better' implies those achieving academically at a higher level, a number of studies suggest that they have strongly supported this hypothesis. Duignan (2003) followed up his initial work with another 'statistical analysis of academic performance in the base year (pre-placement) which suggests an element of self-selection in that those who had elected to undertaken placement were strong academically.' (p.340) 'The issue of a relationship between placement and academic performance was also found to be more complex than that suggested by the underlying hypothesis: there was some evidence indicating that the opportunity for placement may lead to self-selection: those who chose to undertake placement tended to be more academically capable than their non-placement peers.' (p.345) The latter is a premise which it seems important to test in the current analysis. Duignan's references to cognitive models of learning and learning transfer (also found in Raelin (2000) who suggests placements bring maturity in learning approaches) resonates with the findings of this study. This is particularly true in regards to the hypothesis that those students who learn more effectively ('the best students') gain more in terms of academic performance after a placement.

HEFCE's (2009) large scale analysis of attainment in HE supports the link between placement and better degree outcomes. Although agreeing that completion of a placement year improves the final classification from 2:2 to 2:1, Green (2009) suggests that it is not the placement year which does this, but rather previous academic performance. 'The results of this study … indicate that total tariff points at point of entry are positively and significantly related to the final degree mark achieved' (p.29). His statistical analysis is considerably deeper than other studies and this enables him to explore the issues in more depth.

Rawlings, White, and Stephens (2005) look at 'the impact of work-based experience during a placement year on academic achievement of information systems students.' (p.455) Theirs is a longitudinal study using parallel lines ordinal logistic regression analysis. 'In the above model there is a statistically significant interaction between average marks in the second year and placement status on the final degree classification … for all students achieving an average second year mark between 50% and 78% there is an advantage to going on placement … For students achieving an average of mark of 60% in the second year … the probability of graduating with a first class honours or second class (upper division) is substantially greater if they have completed a placement.' (p.458-460) There was unfortunately no control group in Rawlings et al.'s (2005) study 'so there is the possibility that more able students respond better to encouragements to do a placement and respond well again to the stimuli of the working environment.' (pp.461-2) Again the theme that those students who can engage best in effective learning pre-placement is evident. This has implications for advice to those designing learning experiences, as discussed in the conclusion to this paper.

Research Question 3: Do the 'better' students gain more from a placement in terms of degree classification? Once again, if 'better' implies academically stronger, the literature is not conclusive. Gomez et al. (2004) ask, but do not answer, the question whether 'the better students gain more from placement than less academically strong students.' (p.380)

In Duignan's 2003 study, while the post-placement cohort maintained a significantly better level of academic performance relative to their non-placement peer cohort, this was combined with a failure to enhance its performance relative to its Year 2 level of achievement (p.343).

Mendez (2008b) compares the final degree results for three cohorts of engineering students who have or have not undertaken placements. The sample was chosen using their first year results. The results 'seem to corroborate earlier studies and point towards a strong correlation between participation in placements and academic achievement. This argument is strengthened by the fact that the biggest gains in percentage increase occurred amongst those who were previously underperforming.' (p.7) A larger sample size and further analysis may help probe the readings behind the findings more effectively, Mendez and Rona consider some of these issues in their 2010 paper.

Rawlings et al. (2005) indicate that for high achieving level two (current framework level 5) students, with an average second year mark of at least 70%, the advantages of completing a placement year are still beneficial but diminishing … and continue to decline the higher the achiever' (p.460).

Given that all studies indicate that the answer to question 1 above is not as simple as previously indicated, are there any other variables which may influence the relationship between undertaking a placement and improvement in degree classification? Results from Green's 2009 study suggest that 'prior tertiary level performance and the previous study of A-level business studies, contribute positively and in a statistically significant way in explaining the final degree mark achieved.' (p.2) Reddy and Moores (2006), for example, seek to control for the selection problem of placement students using an ANOVA comparing placement and non-placement students from a given cohort. It is likely, however, that this will only partially correct for the sample selection problem. In two random samples that are drawn from identical populations, where the only differentiating factor is whether they have done a placement or not, then providing the sample sizes are large enough for the central limit theorem to apply, ANOVA, or indeed a simple comparison of means will provide a test of whether the effect of a placement is significant. If the two samples are drawn from different populations, however (i.e. one would perform better, or would have different opportunities), which is our assertion, then ANOVA will not allow for sample selection. We, therefore, propose an approach that will offer two extensions to the existing literature. Firstly, it will test whether sample selection effects are important, in the sense of whether there are observable patterns in who chooses a placement and who does not, and secondly how

important these are in explaining performance. We could find no evidence of another study that considered the range of variables which are required to address these issues, or employs a methodology that appropriately allows for the inter-relationships between ability, placement and performance. This is the focus of our current study.

Methodology

In all of the cases discussed above, the essential problem remains, firstly, that the two main questions **"Does undertaking an integrated work placement improve your degree classification?"** and **"Do the 'better' students go on placement?"** have a large degree of overlap. Put simply, there exists a sample selection problem in addressing question one that is framed in question two. In terms of standard regression analysis, one requires an approach that is able to distinguish between these two effects. The approach proceeds as follows:

If π is any potential indicator of performance, a basic model that encapsulates these effects can be defined as follows:

$$\pi = \beta x + \delta z + \varepsilon \qquad (1)$$

Where: x is a vector of individual characteristics, and z is a binary variable taking value 1 if an individual undertook a placement, and 0 otherwise. In this model, the size, sign and significance of the coefficient on the 'treatment' term (i.e. δ) will give an indication of the impact of placement on performance. It is well known, however, that such treatment coefficients will give an unbiased indication of the real effect of placement only if the probability of doing a placement is randomly distributed across the population of students. Where there is any element of systematic targeting or selection (certain types of students being more or less likely to take a placement), the coefficient on the treatment term will reflect a combination of 'placement' and 'selection' effects. It is important in this context to consider what one may mean by the term "better". Clearly in the context of final performance (or improvement) this refers to final degree performance, and it is this that one must correct for with the selection model. However, we also need a variable that captures performance before the placement, and for this we used both first year marks, and entry grades. In general, entry grades gave more robust results, perhaps because they are more widely understood by potential employers of placement students. However, as we discuss below in detail, this is not the main issue with the sample selection model, the main issue is that the approach relies on the so called "exclusion restriction" and this is discussed below.

Rather than direct estimation of equation (1) a preferable approach is therefore to allow explicitly for this type of selection bias. Specifically, we assume that the likelihood or probability of undertaking a placement (z^*) is itself related to a set of individual characteristics, v. This suggests a model of the form (Greene 1995, p.642):

$$\pi = \beta' x + \delta' z + \varepsilon$$

$$z^* = \gamma' v + w \qquad (2)$$

What is observed, however, is not the probability of an individual undertaking a placement (z_i^*) but a categorical variable which indicates whether an individual did a placement or not. In this situation the standard estimation method for this type of model is the two-stage procedure outlined in Heckman (1979). The first stage involves the estimation of a Probit model to estimate the probability of an individual undertaking a placement. The second involves the estimation of the student performance model, incorporating -the selection parameter (the Mills ratio) in the treatment model (see Greene 1995, p.639 for details). In these terms, a positive (negative) and significant coefficient on the Mills ratio is indicative of a positive (negative) sample selection problem, placements being skewed towards high (low) performing individuals. An important issue in operationalising the Heckman type model is the avoidance of too much overlap between the selection and performance models. Once that is determined, it is possible to use the information derived here to control for this probability, when determining the impact of a placement on final degree performance.

In order to evaluate the impacts of a choice made by an individual, one needs to ensure that any apparent positive relationship is not spurious. For example, it may be that better individuals make better choices, or that better individuals are given better opportunities. In other words, the decision to undertake a placement is not a random event, but based on both the range of options available to a given student, and their ability to identify the benefits of those options. , Examining the effect ex poste, however, one observes two samples drawn from two unknown populations, and begin with a sample of individuals that do, and do not make a given choice (in this case whether to a placement year), and seek to determine whether there are definite patterns in the data associated with that choice. If choice of a placement year is essentially a random event, and the sample individuals approaches the population, a straightforward ordinary least squares (OLS) regression will suffice, and providing no other econometric problems arise, will provide an unbiased estimate of the choice. In practice, however, these conditions seldom arise. Also, while one can seek to obtain a stratified sample of non-recipients that matches closely the recipient group, this can never be perfect as there are essentially an infinite number of individual characteristics.

The identification problem and finding a suitable instrument

The essential problem in this approach is that the two equations are separately identified, that is that there is at least one variable that impacts on stage one but not on stage two. In other words one has to find a characteristic that is correlated with the likelihood of a student choosing to take a placement, but uncorrelated with the ability of the student. For this we use the background of the student, measured by the National Statistics Socio-economic Classification (NS-SEC) of the parents, and type of school attended. The former includes variables capturing higher managerial and professional, lower managerial and professional, intermediate occupations, employers in small organisations and own account workers, lower supervisory and technical, semi-routine or routine occupations. The latter includes variables capturing previous attendance at a tertiary college. We suggest that students from certain backgrounds may be more likely to appreciate the advantages of doing a placement, or have less disincentive towards taking longer over their degrees. Archer & Hutchings (2000) in their studies into student experiences of Higher Education, identify the concept of 'risk' as an influencing factor in the decision to remain in the family home. For some non-traditional students participating at all in the HE sector is as far a risk as they are prepared to take, and the risk of also leaving the family home is not taken. It is suggested that for the groups not undertaking a placement as part of their studies, this concept of risk is again influencing their decisions. In addition, the impact of debt on student participation and retention is well documented (e.g. Callender and Jackson 2005 and Thomas 2002) which again may impact on a student's decision to undertake a placement. Students may be concerned about debts experienced during their period of study, which a paid placement may allay slightly, but also with the debts accrued or anticipated after study such as replaying a student loan. Hills and Thom (2005) also identify international students' financial concerns in committing to study in the UK. However, while there is strong evidence that background is an important determinant in the likelihood of a student getting to university, there is no reason that this will impact on degree performance, especially when we already control for performance earlier in their university career.

Our approach then is to employ a general to specific modelling strategy. This involves choosing a set of variables that can reasonably be expected to be significant. The model is then tested systematically in terms of removing insignificant variables, and testing for subsequent loss of predictive power, until one arrives at the final specifications.

The choice of data used in this research was based on undergraduate Combined Honours students (those studying two subjects) within a UK university who studied Business Administration as one of their two subject areas. This cohort has the opportunity to undertake a placement as part of their studies, but this is voluntary. All students are signed up for the placement on entry to the degree. By the end of their second year students have to make a decision as to whether to take a placement or not. All students can apply for any job available and may also look for their own placement. In order to examine the variables selected in this research it was essential that a control group was available within the same cohort.

Data was extracted from the student management system during 2008 and included all students studying Combined Honours Business Administration who had completed their degree programme. As placements are designed to relate, not just to the business part of the degree, but the overall degree, for example a business and psychology student may have a placement in an HR function, then we consider

the impact of the placement, not merely on the business performance, but on the overall degree performance, The sample drew on students who graduated between 2002 and 2008, including those that had undertaken a placement as an integral part of their studies and those that had not. The sample consists of a diverse population in terms of ethnicity. The gender split is 338 female to 254 male. There were only 22 mature students in the data set; this is representative of the programmes available at the institution involved in this research.

The entry score was not available for all students (n=327), however, where the data was present the average entry score was 267 UCAS points (equivalent to a grade B and two grade Cs in three A-levels). This score varied, however, between years, reflecting the national trend of entry scores. Over half of the sample (54%) came from state schools (including Grammar Schools), 12% came from Independent Schools, 11% from Further Education Colleges and 21% from British Council Education Centres which provide access opportunities to HE for international students. Data is not held for 5% of the sample.

The sample was also from a diverse socio-economic background. The graph below illustrates the NS-SEC data for the cohort.

Graph 1

The sample includes students from the following English Government Office Regions: North East, North West, Yorkshire and The Humber, East Midlands, West Midlands, East of England, London, South East and the South West.

As indicated above, all students within the cohort studied Business Administration as half of their combined honours programme. The table below (Table 1) lists the other subjects studied by the students.

Table 1

The descriptive statistics of the key variables and correlation coefficients between them are included in tables 2 and 3.

Tables 2 and 3

Table 4 provides a more detailed breakdown on performance comparison between placement and non-placement students.

Table 4

The analysis shows that on average, placement students do approximately 3.5% better in the second year than non-placement students, and they have a slightly greater improvement between the second and final year. It should be stressed, however, that these differences in themselves are not statistically significant. Placement students do on average just over 4% better in finals than non-placement students. These raw findings appear broadly in line with the existing literature.

Results

How well can we predict the probability of a student undertaking a placement?

We start by estimating the probit model, to examine what determines the decision to undertake a placement. Table 5 presents the determinants of the probability of a given student undertaking a placement. The first column presents the "marginal effect", that is the increased (decreased) probability of a student of a given type undertaking a placement, compared with the reference group. For example, mature students are 52.6% less likely to take a placement than students aged under 21. Equally, students whose parents come from NS-SEC group 2 (lower managerial and professional occupations) are 14% more likely to undertake placements. Interestingly, the results also highlight a lower likelihood of students of Asian background undertaking placements, ranging from 45% less likely for Bangladeshi, to 17% less likely for Indian students.

While the level of significance is lower, the results also highlight some differences in the nature of secondary education received. People from what may be termed less typical education, such as tertiary or art/design colleges, appear more likely to take a placement. This may be due to the fact that they feel the need to take up every possible advantage in the graduate job market. We also control for the course that the student is doing. There is some evidence that those students whose first subject is business are more likely to take a placement (17% more likely in the case of Business Admin and Psychology, and 24% more likely in the case of Business Admin and Public Policy and management). This is perhaps not surprising given that placements are strongly associated with employability.

Table 5

We subsequently move on to the central question, which concerns the relationship between the placement and the final mark in the degree. The dependent variable in this case is the (log of) the average mark in the final year of the students' degree. Table 6 shows the baseline results, and the selectivity corrected results, and the comparison is informative. The baseline result suggests that doing a placement improves the final mark by 6% (that is 6% at the mean, i.e. just under 4 percentage points). Clearly students who do better at A-level also do so on average in finals. The result implies that students with 10% better grades on entry obtain on average 3% higher marks in finals.

What is most striking, however, is when one compares the baseline with the sample selection-corrected results. The effect of doing a placement becomes insignificant, while the sample selection term is positive and significant. In other words, for at least the full sample of students, 'better' students do placements, rather than placements lead to students doing better in finals.

Table 6

Sensitivity testing

In order to examine the effects of a placement in more detail, we pose the following questions:

1. In order to isolate the impact of a placement, should one model, not degree results, but the improvement from years two to four be used?
2. Is the benefit the same for all students? It may be, for example, that 'weaker' students at year two gain more (or less) from a placement.
3. Is the impact on mature students less than average, so if they are excluded from the analysis do the results change?
4. Is "placement" as a discrete term too blunt an instrument, if so, does the quality of the placement matter?

The first one involves refining the model that is used in the degree performance equation, not seeking to explain final year performance, but change in performance between years two and finals. The second two involve focussing on specific groups within the sample, examining the effect of a placement for those who obtained an upper second or a first in year two with the rest. The final question then requires a more sophisticated analysis, focussing only on the placement group, and analysing the impact of the placement mark on final year performance, after controlling for sample selection bias.

The results from this sensitivity analysis relating to the first three questions are presented in Table 7. These compare the placement effect for different sub-groups, employing the Heckman selection-correction technique discussed above.

Table 7

These results confirm the baseline approach, in that the models perform well, and the results are broadly consistent. The effect of previous performance on growth is negative as one would expect – students who do better in year two have less scope for improvement than those who do less well. Overall, these results show no essential difference in the key question – which is whether the effects of a placement impacts on performance. There is no discernable impact on improvement from year two to year four, as the result of a placement. The sample selection effect, however, remains strong, such that better students choose to do placements.

Finally, one may wish to consider whether the quality of the placement has an effect. In order to address this, we include an additional variable, which is the mark awarded to the student at the end of their placement.[1]

In order to do this we employ a similar methodology to that discussed above, but with a subtle difference. This asks the following questions:

1. What determines the probability of a student choosing a placement?
2. Given that a student has done a placement, is the success of the placement important in determining subsequent performance?

Technically, this approach involves estimating a relatively standard selection model, where the probit and the outcome equation are estimated simultaneously. The second stage (the improvement between the second and final year) is only performed, however, on those cases where the individual chose a placement.[2] This tests, and subsequently allows for, sample selection bias but then only estimates the performance effect for placement candidates. The variable used to differentiate between placement students is the mark that they achieved in the placement assignment. This, therefore, augments the Heckman sample selection approach presented above, with an additional question. Does success in the placement, rather than doing a placement per se, determine subsequent performance?

The results presented in Table 8 show the impact on including this when evaluating performance:

Table 8

It is important to note that the previous performance is already taken into account here, such that the model treats success in the placement as independent of ability. In other words, we are asking, given the decision to take a placement, and given the ability of the student, does a successful placement lead to better degree performance?. The calculation at the mean suggests that a 1% difference in the placement mark translates into a 0.09% difference in the marks from year two to final year. When one considers that the mean placement mark is 62%, and the mean improvement mark is 2.86%, this is significant. It suggests that getting 70% for a placement mark rather than 60%, adds 1%, not to the final mark, but to the increase from year two to final year.

Conclusions

The analysis has developed a methodology that has offered answers to the initial questions. While confirming that undertaking a placement year does increase your degree performance, this study has established that the better students undertake a placement. It also shows that it is not these better students who benefit most from the placement in terms of improving their degree classification. The study has also delved deeper into the variables, and illustrated that it is not a placement per se, but a successful placement that leads to improved performance.

To the best of our knowledge, this is the first attempt to address the data selection issues identified to determine the impacts of a placement on degree performance that incorporates academic and socio-economic details of students across a range of degrees. Our data are also valuable because there is significant variation in the entry grades of the students across these programmes, despite all courses having a business element.

[1] In this case the mark is derived from an extended essay asking the student to take an issue in their placement company and to analyse it using theories and techniques learnt in the first two years of their degree.

[2] The sample selection estimator for cross sectional data was initially developed by Bloom & Killingsworth (1985). This is similar to Heckman's "other" famous model, the treatment model. This model permits the inclusion of some variables that are only pertinent to placement students, in this case the mark they obtained in the placement. Again, the key issue is to control for sample selection bias. This is achieved by estimating the two equations simultaneously, and ensuring that the global maximum in the joint likelihood function is derived, see for example Griliches et al (1978) or Verbeek and Numon (1992).

Secondly, it is the first attempt that we are aware of that allows for the rather obvious sample selection problem in ascribing higher performance to the placement. This is possibly because of the problems previous researchers have had in being able to identify pre-and post-placement performance, as well as performance on the placement. This information appears to be missing from previous studies. We show that, allowing for course, qualifications, and socio-economic background differences, much of the difference between placement and non-placement students, is not due to the placement, but to the fact that better students tend to do placements. This is an important message, not only for policy makers, but also employers. These results are robust to the various sensitivity tests employed, including focussing on improvement rather than grade, and on certain sub-samples of the group.

We also show, however, that within the sample of students who do a placement, the better they do in the placement, the better they do in finals. Crucially this is after allowing for the sample selection effect. This again is an important signal for employers and policy makers, that effective placement schemes generate significant pedagogic value, for both the students and the wider community. More immediately, if better placements lead to better marks, there is an onus on placement officers and students to source companies with a well established placement system, well versed in recruiting placement students.

There are limitations to this study which would usefully form the basis of further work. Firstly, the data used comes from only one university and it would be beneficial to replicate it across other institutions, comparing new and established programmes. It may be, for example, that universities where placements are less integrated might produce different results, ones which would help those developing placement frameworks. Secondly, this survey is based on the assumption that a better placement essay and, for example, an employer evaluation, means a better placement. Given the variability of placement opportunities, this may be the only construct to use, but further work would help in clarifying whether this assumption is useful.

Throughout this paper, concepts such as the better student, the more effective learner and the benefits of proven cognitive learning theories have been referred to. Exploration of these in detail were outside the remit of this research, but given that the findings so strongly indicate that pre-placement learning and achievement is such a strong influence, it is clear that another more qualitative piece of work would be fruitful around learner development and learning transfer. For learner developers too, reflection is needed on what helps students to become those better students who can benefit most from placements. This may include issues such as student support, managing placements and communication as discussed in a HEA report 2010), see also Lester and Costley (2010) and Gibson & Busby (2009). Furthermore, it is very important that those groups, such as poorer students, under-represented in placement uptake, are encouraged to undertake a placement, because the findings show that they can benefit the most from such an experience.

Finally, with their 'Higher Ambitions' (2009) agenda in mind, it is clear that successive governments are serious about making students more employable, it needs to be recognised that institutions with well-established placement programmes may offer best value in achievement. Although there are now placement opportunities other than the year-long placement discussed here, such as courses that incorporate one or more periods of work
experience (HEFCE 2009), national data indicates a decline in the numbers of UK students taking up placements (Little and Harvey, 2007) and it is clear that HEIs have a responsibility for ensuring this is reversed.

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Graph 1: Socio Economic Class of Student Cohort

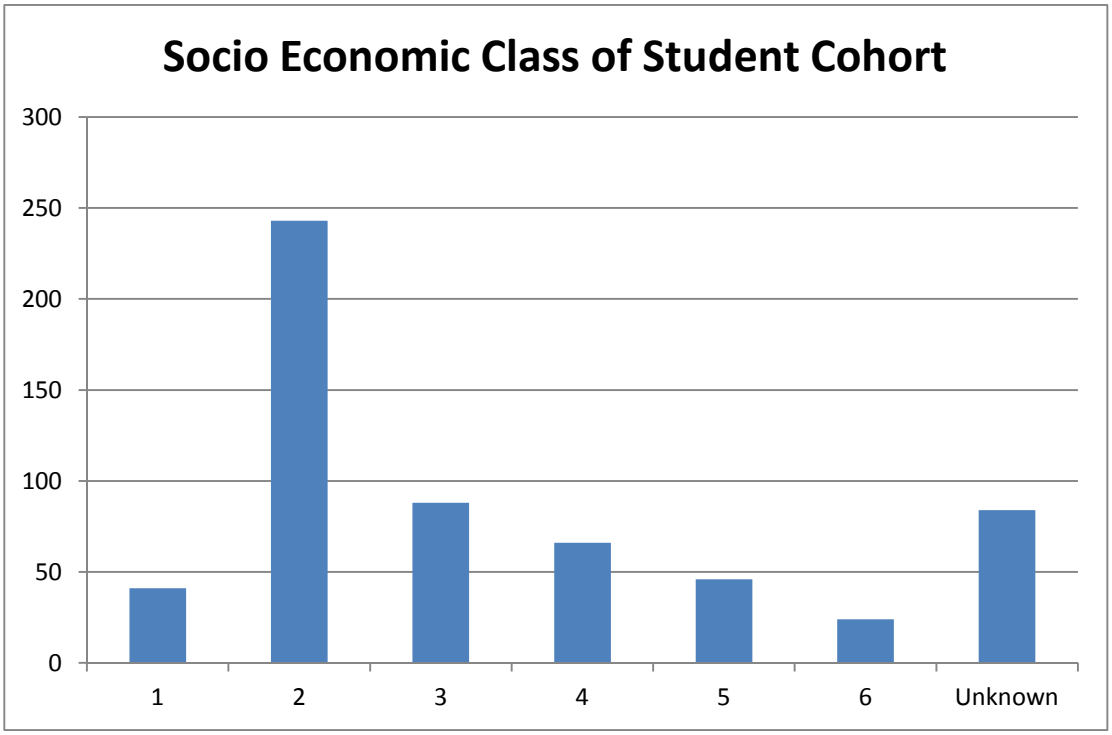

Table 1: Subjects Studied with Business Administration

Subjects Studied with Business Administration
Biology
Chemistry
Computer Science
Environmental Science & Technology
European Studies
French
Geographical Information Systems
German
Health & Safety
Mathematics
Politics
Psychology
Public Policy & Management
Sociology

Table 2: Descriptive statistics for the key variables

	Mean	Std Dev	Minimum	Maximum
Placement	0.56438	0.49637	0	1
Over all mark	60.3053	5.49356	42.15	79.01
Final year mark	61.0654	5.89368	43.98	81.1
Second year mark	58.0249	6.76159	11.76	74.2
Improvement second -final	0.05469	0.12946	-0.2229	1.49191
A level score	183.991	126.045	0	360
Mature	0.0279	0.16485	0	1
Female	0.57725	0.49453	0	1
Deaf	0.00429	0.06544	0	1
Dyslexic	0.02361	0.15198	0	1
Other Unseen disability	0.01073	0.10314	0	1
Other disability	0.00215	0.04632	0	1
Senior professional parent	0.14592	0.35341	0	1
Tertiary college	0.00644	0.08006	0	1
Other secondary school	0.02361	0.15198	0	1
Asian other	0.03434	0.18228	0	1
Bangladeshi	0.03648	0.18768	0	1
Chinese	0.02575	0.15856	0	1
Indian	0.27682	0.44791	0	1
Pakistani	0.08798	0.28357	0	1
BSc Business Admin & Psychology	0.10086	0.30146	0	1
BSc Business Admin & Pubic Policy and Mgt	0.09871	0.2986	0	1
BSc Computer Sci & Business Admin	0.06867	0.25316	0	1
BSc Politics & Business Admin	0.05365	0.22556	0	1
BSc Mathematics & Business Admin	0.06438	0.24569	0	1
BSc Psychology & Business Admin	0.12017	0.32551	0	1
BSc Sociology & Business Admin	0.12232	0.328	0	1

Table 3: Correlations between the key variables

	placement	overall mark	finals year average	second year average	improvement 2nd - final	a level score	mature dummy	female dummy	deaf	dyslexic	unseen disability	other disability
Placement												
Overall mark	0.314											
Finals year average	0.313	0.965										
Second year average	0.204	0.727	0.521									
Improvement 2nd - final	0.027	0.017	0.269	-0.646								
A level score	0.147	0.017	0.016	0.014	-0.001							
Mature dummy	-0.114	-0.135	-0.126	-0.109	0.000	-0.090						
Female dummy	-0.025	0.133	0.096	0.183	-0.109	-0.020	-0.092					
Deaf	-0.075	-0.005	0.011	-0.045	0.052	-0.013	-0.011	0.056				
Dyslexic	0.051	0.015	0.007	0.032	-0.024	0.053	-0.026	-0.039	-0.010			
Unseen disability	-0.035	-0.034	-0.043	0.003	-0.034	-0.021	0.109	0.089	-0.007	-0.016		
Other disability	0.041	0.059	0.070	0.008	0.041	0.028	-0.008	0.040	-0.003	-0.007	-0.005	
Senior professional	0.093	-0.025	-0.031	-0.002	0.006	0.137	0.078	0.009	0.066	-0.024	0.075	-0.019

Table 4: Students choosing a placement

Students choosing a placement (336 students)				
	Mean	Std dev	Minimum	Maximum
placement %	60	8.125	40	85
final average	62.997	5.350	43.98	81.1
second year average	59.792	5.911	42.36	74.2
improvement 2nd-final	3.205	9.221	-19.74	18.615
Students not choosing a placement (228 students)				
final average	58.96	5.773	46.52	75.87
second year average	56.37	8.670	47.12	91.28
improvement 2nd-final	2.589	2.32	-14.5349	12.47

Table 5: predicting the probability of doing a placement, the probit estimation.

Parameter	Marginal effect	t-statistic	P-value
C	-0.2241	-2.10676**	[.035]
ALEVEL	0.53624	2.19700**	[.028]
MATURE	-0.52612	-2.45227**	[.014]
UNSEEN	-0.32752	-1.34437	[.179]
Parents “senior professional”	0.14153	2.05265**	[.040]
tertiary college	0.27370	1.71846*	[.086]
”other secondary school”	-0.41775	-1.68129*	[.093]
Art / Design college	0.24749	1.44547*	[.148]
Asian Other	-0.22532	-1.45839*	[.145]
Bangladesh	-0.45829	-3.00909**	[.003]
Chinese	-0.17734	-1.27058	[.204]
Indian	-0.16823	-2.92608**	[.003]
Pakistan	-0.34532	-3.82430**	[.000]
BSc Business Admin & Computer Sci	0.12343	1.02613	[.305]
BSc Business Admin & Psychology	0.16858	2.08056**	[.037]
BSc Business Admin & Pubic Policy and Mgt	0.24131	2.54763**	[.011]
BSc Computer Sci & Business Admin	0.12410	.999937	[.317]
BSc Psychology & Business Admin	-0.16342	-1.85608*	[.063]
BSc Sociology & Business Admin	0.083430	.933924	[.350]
Number of observations = 327 Scaled R-squared = .189171 Number of positive obs. = 196 LR (zero slopes) = 63.4985 [.000] Mean of dep. var. = .599388 Sum of squared residuals = 64.4173 Log likelihood = -188.406 Fraction of Correct Predictions = 0.681957			

Table 6: Estimation of the placement effect on final year performance

	Non-selectivity corrected results (OLS)			Selectivity corrected results (heckman)		
Variable	Coefficient	t-statistic	P-value	Coefficient	t-statistic	P-value
C	3.16991	9.65149**	[.000]	2.97927	8.84064**	[.000]
PLACEMENT	.062525	4.91109**	[.000]	-.012850	-.360639	[.719]
ALEVEL	.159149	2.69107**	[.008]	.202212	3.27420**	[.001]
MATURE	-.024837	-.589009	[.556]	-.060177	-1.34598	[.179]
FEMALE	.022045	1.74221*	[.082]	.022004	1.75041*	[.081]
OTHER disability	.108469	1.00046	[.318]	.121907	1.13006	[.259]
Bangladeshi	-.023657	-.694163	[.488]	-.052797	-1.45753*	[.146]
Chinese	-.046523	-1.30922	[.191]	-.060354	-1.68453*	[.093]
Indian	-.038827	-2.86917**	[.004]	-.048015	-3.41891**	[.001]
BSc Politics & Business Admin	.159617	3.48116**	[.001]	.155832	3.41859**	[.001]
BSc Computer Sci & Business Admin	.039247	1.33030	[.184]	.045811	1.55539*	[.121]
BSc Mathematics & Business Admin	.039057	1.34687	[.179]	.042089	1.45937*	[.145]
Mills ratio				.051564	2.26288**	[.024]
	Number of observations: 325 Mean of dep. var. = 4.10072 LM het. test = 1.62682 [.202] Std. dev. of dep. var. = .116851 Sum of squared residuals = 3.64480 F (zero slopes) = 6.08300 [.000] R-squared = .176127 Adjusted R-squared = .147173 Log likelihood = 268.555			Number of observations: 325 Mean of dep. var. = 4.10072 LM het. test = 3.11973 [.077] Std. dev. of dep. var. = .116851 Sum of squared residuals = 3.58594 F (zero slopes) = 6.07621 [.000] R-squared = .189430 Adjusted R-squared = .158255 Log likelihood = 271.201		

Table 7 Analysis of improvement from year 2 to final year, in marks terms.

	Full sample		Upper second or above		Lower second or below		Excluding mature students	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	2.83847	18.9748**	2.83654	18.9781**	2.85480	19.2440**	115.385	15.2807**
Placement	.823755E-02	.179108	.920822E-02	.197494	-.010228	-.213655	-0.00246	-.873786
SECOND	-.731597	-19.6183**	-.731315	-19.6143**	-.735300	-19.8279**	-0.0028.9	-15.9786**
ASCORE	.582065E-03	2.84465**	.585961E-03	2.81995**	.603541E-03	2.97847**	.075284	1.33510
MATURE	-.079205	-1.79187*	-.077328	-1.77676*	0.	0.		
FEMALE	.565019E-02	.514304	.560717E-02	.510409	.833085E-02	.752464	.492520	.442135
DEAF	-.356536E-02	-.039179	-.316593E-02	-.034680	-.015279	-.168652	-18.7364	-.886073
DYSLEXIC	-.017058	-.570449	-.017195	-.575091	-.014791	-.500146	-1.20148	-.623430
UNSEEN	-.049022	-.954149	-.048586	-.945818	-.054530	-1.07265	-9.53879	-1.12137
MILLS	.144342	2.64022**	.143269	2.62945**	.185546	2.67375**	.166508	1.39650
Course dummies	yes		yes		yes		yes	
Ethnicity dummies	yes		yes		yes		yes	
School dummies	yes		yes		yes		yes	
n	321		187		134		299	
	Mean of dep. var. = .055421 LM het. test = 50.2618 [.000] Sum of squared residuals = 1.82297 Variance of residuals = .701143E-02 Ramsey's RESET2 = 33.8810 [.000] F (zero slopes) = 8.69030 [.000] R-squared = .667272 Adjusted R-squared = .590488 Log likelihood = 374.462		Mean of dep. var. = .053023 LM het. test = 49.8877 [.000] Sum of squared residuals = 1.82333 Variance of residuals = .701279E-02 Ramsey's RESET2 = 33.8122 [.000] F (zero slopes) = 8.68777 [.000] R-squared = .667207 Schwarz B.I.C. = -221.488 Adjusted R-squared = .590409 Log likelihood = 374.431		Mean of dep. var. = .056315 LM het. test = 49.0302 [.000] Sum of squared residuals = 1.73921 Ramsey's RESET2 = 33.0677 [.000] Std. error of regression = .082748 F (zero slopes) = 8.82248 [.000] R-squared = .675751 Adjusted R-squared = .599157 Log likelihood = 371.899		Mean of dep. var. = .58586 LM het. test = 1.10992 [.292] Sum of squared residuals = 6607.14 Ramsey's RESET2 = 2.45301 [.118] Std. error of regression = 4.65433 F (zero slopes) = 32.1915 [.000] R-squared = .487156 Adjusted R-squared = .472023 Log likelihood = -926.291	

Table 8: the impact on the final performance of the placement for only placement students

Variable	Coefficient	t-statistic
C	139.160	9.012**
Placement %	.0041968	3.673*
Second year performance	-33.3838	-7.961**
A level score	-.00463	-.260
MATURE	3.78124	.610
DYSLEXIC	-3.62516	-1.441*
selection term	0.33687	5.683**
Course dummies	yes	
Ethnicity dummies	yes	
School dummies	yes	
Number of observations = 322 Number of positive obs. = 193 Log likelihood = -693.693 Fraction of positive obs. = 0.599379		

Slide Presentation:

Aston University

Placements and degree performance

Do placements lead to better marks or……

do better students choose placements?

Presented on behalf of Professor Helen Higson by Maureen Tibby

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Aston University

Excellent reputation for enhancing student and graduate employability

- Industry focussed programmes & employable graduates
- Consistently excellent league table rankings for graduate employability
- Winner of inaugural Rate my Placement award for *University with Most forward thinking attitude to work-based* learning

Aston University

Innovative and forward thinking Integrated work placements

Over 60% of Aston's undergraduate students take 'sandwich' courses
* Target for 2012 is 80%
*Target for 2020 is 100%

International work placements in 30 + countries

International student exchange

Over 800 Aston undergraduate students take a 12 month placement

Aston Business School placement database advertises over 2,500-3,000 opportunities each year

1200 placement vacancies a year generated by Careers and Employability Service

*2011 new structure merges placement support at Aston

Aston University

Research informs practice at Aston University

Placements and degree performance: Do placements lead to better marks, or do better students choose placements? 2011

- Driffield, N.L, Foster, C.S., and Higson, H.E.* Aston University, Birmingham B4 7ET

No regrets? Measuring the career benefits of a psychology placement year 2011

- Elisabeth Moores and Peter Reddy Psychology, School of Life and Health Sciences, Aston University
- Using data from the DLHE survey, investigates whether placement experience confers any early career benefits

Aston University

Research Paper

Placements and degree performance:

Do placements lead to better marks or……

do better students choose placements?

Authors: Driffield, N.L, Foster, C.S., and Higson, H.E

Aston University

Context of research

- Government push to make degree more applicable to world of work
- Including work placements as part of the course is one way of making degrees more applicable to employment.
- Placements are advocated to enhance academic performance (Gomez et al 2004, Rawlings et al 2005, Green 2009)
- Placements are advocated to enhance employability (Moores & Reddy 2011) [1]
- This paper examines the relationship between undertaking a work placement and the class of degree achieved and challenges earlier findings that undertaking a placement increases degree results.

[1] Moores, E. & Reddy, P. (2011) No regrets? Measuring the career benefits of a psychology placement year, Assessment and Evaluation in Higher Education (in press)

Aston University

Research questions

- Does undertaking an integrated work placement improve your degree classification?
- Do the 'better' students go on placement?
- Do the 'better' students gain more from a placement in terms of degree classification?

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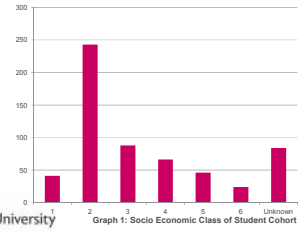
Data

- Surveyed 7 cohorts of students, all Aston students studying Combined Honours Business Administration who graduated 2002 to 2008.
- Included those that had undertaken a placement as part of their studies and those that had not.
- Ethnically diverse population;338 female, 254 male, 22 mature students



Graph 1: Socio Economic Class of Student Cohort

Aston University

HEFCE (2009) analysis of student characteristics relating to whether they had or had not taken a placement show that those who undertook a placement had different characteristics from those who had not taken a placement, for example those who did were more likely to be male and from higher socio-economic classes (1-3).

Graph 1 includes variables capturing higher managerial and professional, lower managerial and professional, intermediate occupations, employers in small organisations and own account workers, lower supervisory and technical, semi-routine or routine occupations

Methodology

- **To avoid bias**
  - employed sample selection model developed by Heckman (1979).
  - aimed to find a characteristic correlated with likelihood of students choosing to take placements, but uncorrelated with their ability
  - used the background of the student, measured by the National Statistics Socio-economic Classification (NS-SEC) of the parents
- **Approach**
  - employed a general to specific modelling strategy; started with variables that conceptually or theoretically may be significant.
  - the model was then tested systematically and insignificant variables were removed
  - tested for subsequent loss of predictive power, until arrival at the final specifications.

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Conclusions of research

- The analysis successfully answered the original research question;
  - undertaking a placement year does increase your degree performance
- **however…** the study also established that;
  - it is the better students who undertake placements
  - that the less academically strong students benefitted the most from a placement
  - that it is not a placement, per se, but the quality of the placement that enhances academic performance.

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Moving forward: expanding the research

- Successful Grant to HEA to expand study (£7,000)
- Replicate study (Sept-Dec 2011) with wider data sets to test validity and findings across the sector
- Produce findings to inform employability strategies
- Conduct qualitative research to explore issues for students in accessing placements (Feb-May 2012)
- Provide advice and guidance to policy makers in HEIs to inform decisions on designing and implementing placement programmes

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The research will have four strands

- Quantitive Research
- Qualitative Research
- Dissemination (academic and practitioner)
- Evaluation

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Quantitative research

- Replicate study Sept-Dec 2011
- Wider data sets to test validity and findings across the sector as a whole
- Wider range of disciplines at Aston across Schools of study
- A similar set of students from the University of Ulster

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Qualitative research

- **Focus groups:** four in each institution, involving 5-8 students to create a collective view and elicit opinions and attitudes
- **Students:** will include; those who did a placement and those who did not, those academically high performing (above 65%) and those performing less well (below 50%).
- Questions addressed will include;

Why do some students **not** choose placement options?

What can we do to address this?

What can we do to motivate and support them?

How can we create effective relationships (student, employer, HEI) to ensure quality placement experiences?

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Dissemination

At Aston University:

- presentation in the Centre for Learning Innovation and Professional Practice (CLIPP) seminar series
- publication in annual Aston Business School Good Practice Guide
- Incorporation into institution-wide placement initiatives via the Aston Employability Group and in discussion with Student Guild Officers (author is Chair of Aston University Employability group)
- Implementing the findings
  - increasing the uptake of placements especially from groups who can benefit from greater participation

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Dissemination

At University of Ulster

- the findings will be disseminated across University of Ulster via the same methods as internally at Aston University
- a presentation of the findings to relevant staff and engagement with key groups to implement into practice.
- ensuring that the findings inform their practice.

University of Ulster

Sector wide engagement through;

- annual ASET Conference paper
- HE Academy Annual Conference paper
- production of a policy maker's guide
- production of a student advice guide;
  - benefits of a placement
  - how to prepare for and make the most of placement

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Evaluation

- Aim to seek partnerships to widen out the research to other areas and to link with related projects.
- To this end the project includes an external evaluation at two stages.
  - After six months there will be a review of progress by a 'critical external friend'.
  - In the last month of the project there will be an independent evaluation of findings.

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Timescale

Key Milestones	
Quantitative Phase	Date
Data gathering from inside Aston	Sept-Oct 2011
Data gathering from Ulster	Sept-Oct 2011
Data analysis	Nov-Dec 2011
Production of quantitative findings	Jan 2012
Initial dissemination activities	Jan-Mar 2012
Initial evaluation by critical friend	Feb-Mar 2012
Qualitative Phase	
Focus groups at Aston and Ulster	Feb-May 2012
Write up findings and disseminate	May-July 2012
Key Conferences/Presentations	
Aston internal presentation of all findings	June 2012
Presentations at Ulster of all findings	June 2012
Good Practice Guide article	1 Sept 2012
ASET paper	June 2012 for conference Sept 2012
HE Academy paper	March 2012 for conference June 2012
Referred journal article	After Sept 2012
Production of Guides	By 31 August 2012
Final independent evaluation	July-Aug 2012

Why this research is important

- This research is important at a time when it is reported that there is a decrease in uptake of placements (Little and Harvey, 2007)
  - regrettable when so much evidence highlights the advantages of such experience.
- With the fees environment changing, the development and enhancement of employability skills is even more important
  - it is therefore crucial to engage students and promote the advantages of undertaking a placement, particularly to under-represented groups

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Selection of references (all references available in final paper)

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