Open Journal of Social Sciences, 2016, 4, 177-181
Published Online January 2016 in SciRes. http://www.scirp.org/journal/jss
http://dx.doi.org/10.4236/jss.2016.41022

The Effect of Work-Based Placement on the Final Year Attainment of Students Reading for a Broad BSc Hons Degree Programme in Biosciences in Northern Ireland—Case Report

Violetta Naughton, Patrick J. Naughton

School of Biomedical Sciences, Ulster University, Coleraine, Northern Ireland
Email: v.naughton@ulster.ac.uk, pj.naughton@ulster.ac.uk

Received 21 December 2015; accepted 25 January 2016; published 29 January 2016

Abstract

This case report presents an evaluation of the effect of a work-based placement on the achievements in the final year of the undergraduate degree. We also aimed to assess whether "better" students were opting to take up a placement year and if such a con-founder would have an influence on the effect of placement on final year performance. Retrospective data were collected for ten consecutive cohorts of students who had read for the same full time BSc Hons degree programme with a broad curriculum that offered an optional work-based placement year that was not closely aligned to their academic studies. The results have shown that "better" students opt to take up an optional work-based placement year; however, taking up the placement has not affected students' final year attainment. This case report supports the notion that for a work-based placement to have a positive effect on students' final year attainment, the placement must be closely aligned to the discipline of academic study.

Keywords

Undergraduate Degree, Final Year Attainment, Work-Based Placement

1. Introduction

In UK higher education system, the duration of full-time bachelor's of science (BSc) degree with honours (Hons) programmes is normally three to four academic years. The programmes of four-year' duration, usually consist of

How to cite this paper: Naughton, V. and Naughton, P.J. (2016) The Effect of Work-Based Placement on the Final Year Attainment of Students Reading for a Broad BSc Hons Degree Programme in Biosciences in Northern Ireland—Case Report. *Open Journal of Social Sciences*, **4**, 177-181. http://dx.doi.org/10.4236/jss.2016.41022

three years of academic study and a year of work-based placement. The work-based placement year typically follows successful completion of the second year and precedes the final year of the programme. In the case of many vocational programmes, work-based placement is fully integrated into the programme *i.e*. it is obligatory and must be passed to allow the progression to the next stage of the programme. In other cases, the year of work-based placement is optional thus allowing students to choose the programme option of three years *i.e*. an option without a placement year. Students are usually strongly encouraged to take up work-based placement as practical experience and the enhancement of employability skills gained in preparation for and during work-based placement is directly associated with graduate employability [1]. Moreover, the results of a number of studies have indicated that the completion of a placement year not only results in the improvement of graduate employability but also in the upgrading of students' academic attainment in the final year of their programmes [2]-[5]. However, the literature also indicates that when work based placement is offered to students as a programme option, its' effect on students' academic attainment in the final year is confounded by the students' self-selection. For example, Rawlings *et al*. [6] have shown significant interaction between students' attainment in the second year and their decision to take the work-based placement year. Those findings were later confirmed by the results by Driffield *et al*. [7] who stated "While confirming that undertaking a placement year does increase your degree performance, this study has established that the better students undertake a placement". However, more recent published results by Jones *et al*. [8] agreed with the previous findings *i.e*. "The results of this paper have shown clearly that there is evidence of self-selection which gives credence to the argument that past studies that analyze the impact of work sandwich placements on student performance might well be upwardly biased. Nevertheless, the effect of taking an integrated sandwich work placement appears still to have a positive and significant impact on final year academic performance". Jones *et al*. [8] have also noted "that work placements that are aligned to academic disciplines are more likely to lead to superior performance". This would suggest that a work-based placement year may have a lesser impact on students' final year attainment where it is combined with a fundamental science programme whose broad curriculum does not or cannot be strictly aligned with the content of a work-based placement year.

This study therefore aimed to assess whether undertaking an optional work-based placement year had an effect on students' achievements in the final year of their degree. We also aimed to assess whether "better" students were opting to take up a placement year and if such a con-founder would have an influence on the effect of placement on final year performance. The programme selected for this study offers an optional, year-long work-based placement that students may choose to undertake after completion of year 2 of their academic study. Successful completion of a year long work-based placement is not required to progress to the next stage *i.e*. final year of the programme; however, it is recognised by an additional qualification that is awarded in conjunction with the BSc Hons award at the graduation.

2. Materials and Methods

Ten consecutive cohorts of students who have read for the same full time BSc Hons degree programme were included in this case study. In each academic year, starting from year 1 of the programme, all students have been introduced to the programme structure, including availability of a work-based placement year. In year 2 of the programme, each cohort has been provided with scheduled weekly sessions on placement awareness vs. careers options; these sessions also included practice in CV writing, mock-interviews; students have been also invited to career fairs and have been advised on industrial contacts to facilitate their decisions both regarding taking up the work-based placement and future career options.

The following characteristics and data were collected for each student: 1) gender (male or female); 2) study option, *i.e*. the three-year, full-time option without a work placement year or four-year, full-time option that includes a work-based placement year; 3) second year, weighted average mark (as percentage) calculated from second year modules amounting to 120 credit points with the contribution of each module according to its credit value; 4) final year, weighted average mark (as percentage) calculated from results of the final year modules amounting to 120 credit points, with the contribution of each module based on its credit value. Furthermore, an additional two variables were generated: a) second year qualitative attainment; namely, each student was allocated into one of the four groups *i.e*.: group 1 (at least 70% year average), group 2 (at least 60% and less than 70% year average), group 3 (at least 50% and less than 60% year average) and group 4 (less than 50% year average) based on achieved second year, weighted average mark; b) the difference between final year and second year weighted average marks was calculated for each student. The data sets obtained for each student were coded al-

lowing for anonymization of participants. Individuals were excluded from the study if they i) had no data from the second year e.g. those who were admitted directly to the final year of the programme, ii) had no data from the final year e.g. those who exited the course with a lower award, iii) took an option of a year of academic study abroad, iv) did not complete the work-based placement year. The final study population comprised of 90 students, including 32 (36%) males and 58 (64%) females. Of the 32 males, 18 (56%) completed the programme option with the work-based placement year and 14 (44%) completed three-year programme option without the work-based placement year. Of 58 females, 31 (53%) completed the programme option with the work-based placement year and 27 (47%) completed three-year programme option.

The quantitative data were checked for the normality of the distribution using a Kolmogorov-Smirnov (K-S test) test of goodness-of-fit. The K-S test outcomes (D = 0.089, exact $p = 0.471$ and D = 0.110, exact $p = 0.224$, D = 0.107, $p = 0.200$ for final year weighted average mark and second year weighted average mark, respectively) provided no evidence against the null hypothesis that each sample has been drawn from a normal distribution. The calculated differences (Y) between final year and second year weighted average marks were however not normally distributed (D = 0.099, exact $p = 0.030$) therefore data (Y) were first translated with a constant value a so that min ($Y + a$) = 1 and then $\log_{10}$ transformed which allowed for transformation to normality (D = 0.013, exact $p = 0.050$).

Firstly, to test whether higher achieving students decide to take a study option with a work-based placement year, a full-factorial general linear model (GLM) ANOVA was used to evaluate the effects of gender and the study option on the second year weighted average mark. To test whether student attainment in the second year confounded the possible effects of a work-based placement year on final year performance, a full-factorial general linear model (GLM) ANOVA was used to evaluate the effects of second year attainment and study option on calculated differences between final year and second year weighted average marks. Next, full-factorial univariate GLM ANOVA was used to evaluate the effects of gender (male *vs*. female), second year attainment (group 1 *vs*. group 2, *vs*. group 3 *vs*. group 4), and the study option (with *vs*. without work placement year) and their interactions on the final year weighted average mark. Finally, a two-tailed partial correlation analysis was carried out to obtain first order correlation coefficient ($rxy.i$) for the final year weighted average mark (x) and the second year weighted average mark (y), controlling for the effect of a study option (i) *i.e*. with or without a placement year, followed by a simple linear regression to assess if second year weighted average mark would serve as predictor of the final year weighted average mark. In all analyses, $P < 0.05$ was assigned as the level of statistical significance. Data are presented as mean values with 95% confidence intervals (95% CI) unless stated otherwise. The statistical analyses were performed with SPSS (IBM®, SPSS Statistics, v. 22.0.0.0).

3. Results

3.1. Do "Better" Students Take up a Work-Based Placement Year and Does Self-Selection Influence the Effects of a Work-Based Placement on Students' Performance in the Final Year?

Univariate main effect on the study option (SO) for second year weighted average mark was significant (F (1, 86) = 8.968, $p = 0.004$) indicating that better performing students opt to take a work-based placement year (60.00 ± 2.51 vs. 54.34 ± 2.79 for SO with and without placement, respectively, $p = 0.004$). The effect of gender (G) and its interaction with SO on the second year weighted average mark was not significant *i.e*.: F (1, 86) = 3.491, exact $p = 0.065$ for G and F (1, 86) = 1.279, exact $p = 0.261$ for GxSO. This would indicate that gender does not influence students' decision to take a placement year. Furthermore, the results of the effects of second year attainment and the selected study option (*i.e*. with or without placement) on calculated differences between final and second year average marks (for results see **Figure 1**) showed significant univariate main effect for the second year attainment (SA) (F (3, 82) = 11.22, $p < 0.0001$) but not the study option (SO) and its interaction with SA, which were not significant *i.e*.: F (1, 82) = 0.195, exact $p = 0.660$ for SO and F (1, 82) = 2.748, exact $p = 0.051$ for SAxSO.

3.2. Did Those Who Opted for a Work-Based Placement Year Improve Their Academic Performance in the Final Year of Their Degree?

Second year attainment (SA) had a significant effect on the final year weighted average mark (F (3, 75) =

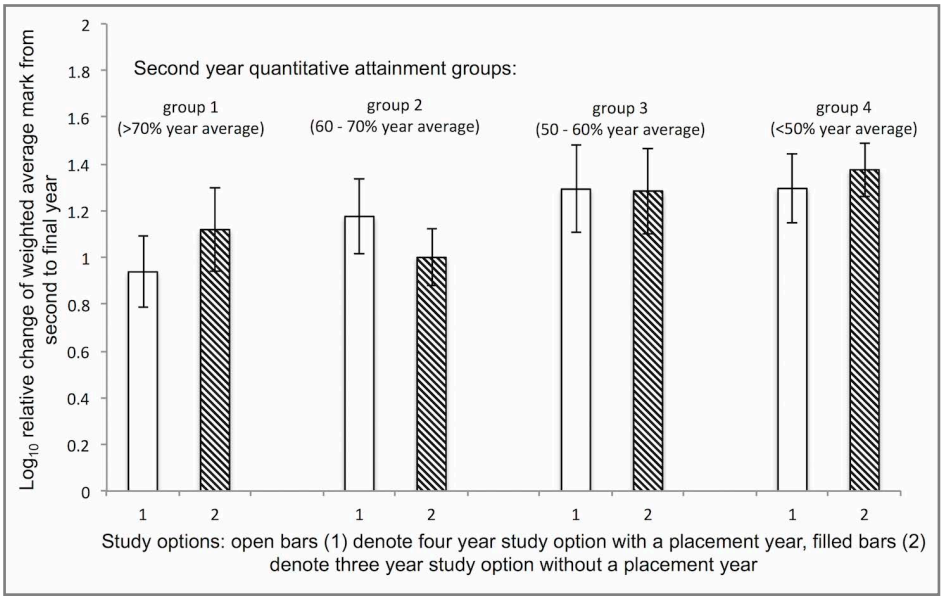

Figure 1. The effect of the study option with or without work-based placement year clustered into groups according to the second year attainment based on calculated differences between final and second year weighted average marks. Data are presented as means with 95% confidence intervals.

10.097, $p < 0.0001$). The effects of the two other main factors were not significant *i.e.*: F (1, 75) = 2.807, exact $p = 0.098$ for gender (G) and F (1, 75) = 2.347, exact $p = 0.13$ for the study option (SO). The interactions between tested main factors included in the model, in all combinations were non-significant *i.e.*: F (1, 75) = 3.804, exact $p = 0.054$ for GxSO, F (3, 75) = 0.376, exact $p = 0.771$ for GxSA, F (3, 75) = 0.499, exact $p = 0.684$ for SOxSA, and F (2, 75) = 1.064, exact $p = 0.350$ for GxSOxSA. The results of partial correlation analysis controlling for the study option (with or without work-based placement year) showed a significant positive ($r = 0.65$, $p < 0.0001$) relationship between final year and second year weighted average marks, while the effect of study option was not significant ($r = -0.267$, $p = 0.616$). After exclusion of the study option, the results of simple regression analysis showed that students' performance in the final year could be predicted from their second year performance (F (1, 88) = 76.45, $p < 0.0001$, with R^2 of 0.465), namely final year weighted average mark (y) = 30.22 + 0.524x, where x is second year weighted average mark.

4. Discussion

The results of this study show that within the surveyed population, those that performed better academically opted to take up the optional work-based placement year. Our results also show that taking up the placement did not improve these students' final year attainment. This is in agreement with the previous results by Driffield *et al.* [7] showing that "'better' students do placements, rather than placements lead to students doing better in finals". Jones *et al.* [8] in their study have showed that "better" students undertake an optional work-based placement year (so called self-selection factor), however, they have also shown that the placement year has significant positive effects on students' final year attainment regardless of the self-selection. However, a closer look at the results of Jones *et al.* [8] show that the work-based placement when the self-selection factor is excluded only improves the final year attainment of students on programmes within specific disciplines e.g. Business, Engineering and Applied Sciences and not so much in the results of students reading for degrees within Languages, Social Sciences or Life and Health Sciences. The authors themselves concluded "The results may indicate that it is not just placements *per se* that improve final year performance, but how well the placement is aligned (…) with a student's academic discipline". The result of our study would support this notion. To elaborate, the undergraduate program that was selected for this study offers a breath of biosciences disciplines such that close alignment to a work placement for all its study options is not a practical possibility. Thus is could be suggested that the lack of direct vocational relevancy *i.e.* the lack of a direct relationship between work-based placement

and academic studies weakens the effects of the work-based placement on students' final year attainment.

In the light of the current results it can be suggested that positive effects of a work-based placement on final year attainment may not be clear cut for students reading for non-vocational programs. But undeniably, the opportunity of a work-based placement must be provided to the students to improve their employability? According to *The Graduate Market in* 2015 report for UK [9], in 2014 approximately 30% of graduate positions were filled by the graduates who had already completed work-based placement or vacation work for these organisations; the same report predicts that this type of recruitment will increase to 50% in the near future. Notably, the same report [9] states "Nearly half the recruiters who took part in the research repeated their warnings from previous years-that graduates who have had no previous work experience at all are unlikely to be successful during the selection process and have little or no chance of receiving a job offer from their organisations' graduate programmes" (p. 26). This clearly indicates that the opportunity of a work-based placement, albeit of a shorter duration perhaps may need to be provided to students to increase their chances of gaining employment directly after graduation.

The results of this case report support the notion that for a work-based placement to have a positive effect on students' final year attainment, the placement must be closely aligned to the discipline of academic study. However, further work needs to be done to compare the benefits of work-based placements in vocational and non-vocational degree programmes.

Acknowledgements

The authors declare that there is no conflict of interest regarding the publication of this paper.

References

[1] Brooks, L. and Youngson, P.L. (2014) Undergraduate Work Placements: An Analysis of the Effects on Career Progression. Studies in Higher Education. http://dx.doi.org/10.1080/03075079.2014.988702

[2] Mandilaras, A. (2004) Industrial Placement and Degree Performance: Evidence from a British Higher Institution. *International Review of Economics Education*, **3**, 39-51. http://dx.doi.org/10.1016/S1477-3880(15)30146-8

[3] Surridge, I. (2008) Accounting and Finance Degrees: Is the Academic Performance of Placement Students Better? *Accounting Education*, **18**, 471-485. http://dx.doi.org/10.1080/09639280802008498

[4] Mansfield, R. (2011) The Effect of placement Experience upon Final-Year Results for Surveying Degree Programmes. *Studies in Higher Education*, **36**, 939-952. http://dx.doi.org/10.1080/03075079.2010.486073

[5] Crawford, I. and Wang, Z. (2014) The Impact of Placements on the Academic Performance of UK and International Students in Higher Education. Studies in Higher Education. http://dx.doi.org/10.1080/03075079.2014.943658

[6] Rawlings, P., White, P. and Stephens, R. (2005) Practice-Based Learning in Information Systems: The Advantages for Students. *Journal of Information Systems Education*, **16**, 455-464.

[7] Driffield, N., Foster, C. and Higson, H. (2011) Placements and Degree Performance: Do Placements Lead to Better Marks or Do Better Students Choose Placements? *ASET Annual Conference*, Leeds Metropolitan University, Headingley Campus, 6-8 September 2011. http://eprints.aston.ac.uk/18824/1/Placements_and_degree_performance.pdf

[8] Jones C.M., Green J.P., Higson H.E. (2015) Do Work Placements Improve Final Year Academic Performance or Do High-Calibre Students Choose to Do Work Placements? Studies in Higher Education. http://dx.doi.org/10.1080/03075079.2015.1073249

[9] Anon (2015) The Graduate Market Report 2015. High Fliers Research Ltd. http://www.highfliers.co.uk/download/2015/graduate_market/GMReport15.pdf