

The value of work placements

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Abstract

This paper reports a study of the impact of work placements on transferable skills. The study was conducted in three engineering departments at Loughborough University. A pre-test intervention post-test model with a control group was used to sample the views of students before and after placements and of students who did not go on placements. These were triangulated with the views of their line managers in industry and their industrial tutors.

The findings indicated that there was strong agreement between students, tutors and line managers on the value of work placements for transferable skills; that students developed their transferable skills on work placements and which transferable skills were developed most effectively on work placements. The consensus of line managers and the DIS (Diploma in Industrial Studies) tutors is that there is no satisfactory alternative to work placements for developing transferable skills. There were mixed views on whether work placements enhanced degree results. In fact, students who did go on placements did obtain better degree grades.

These results demonstrate the value of work placements for the personal and professional development of students. But some caution is necessary in generalising the results to other courses. Work placements differ in structure, content and duration, the evidence on the transferability of transferable skills is not clear cut and impact in this field is more a matter of judgment than measurement.

Keywords: Work placement; work-based learning; transferable skills; skills.

1. Introduction

Work placements have been part of engineering education in the United Kingdom since the 1950s (Brennan and Little, 1996). Their purpose has been variously described as gaining 'employability', 'transferable' or 'generic' skills, developing an understanding of world and work organisations, and understanding the 'real world' application of skills (Ryan et al., 1996; Kerawala et al., 1998; Pickles, 1999; Baird, 2005). Placement-based learning also provides students with an experiential learning experience (Kolb, 1984 cited in Hall et al., 2000). There are various examples of skills (e.g. communication skills, information technology, team working, problem solving, etc.). The eleven skills used in this study are based upon some skills identified by DfES (2005), the skills embedded on the modules taught in the departments surveyed (Chemical Engineering, Civil Engineering and IPTME) at Loughborough University and some of

the skills which are important to any employer (Kelly and Dorsman, 1986; Bennett, Dunne and Carré, 2000; Dench, 1997).

This research project investigated the impact of work placements on the development of transferable skills of students in engineering. For the purpose of this research, work placement was defined as one year in industry. These are the most common form of work placements undertaken by engineering students.

2. Methods of data collection and analysis

Questionnaires were designed, piloted, and administered to 247 engineering students from three department (Chemical Engineering, Civil Engineering and the Institute of Polymer Technology and Materials Engineering (IPTME) (which is now known as the department of Materials) at Loughborough University. 107 second year students completed the pre-placement questionnaires one month prior to the summer vacation in 2006 and 140 more students completed post-placement questionnaires in 2007 (Third year students who went on work placements in 2006/2007 academic year). The questionnaires contained structured questions on placements and transferable skills and some open questions. A brief but similar questionnaire was completed by a sample of line managers in industries and the DIS (Diploma in Industrial Studies) tutors at Loughborough University and used with them in interviews.

This paper reports the summary of the main findings of the students' views, the views of line managers from different companies and the views of the DIS (Diploma in Industrial Studies) tutors from three departments at Loughborough University and the academic performance of the students. SPSS v14 (Statistical Package for the Social Sciences) was used to analyse the quantitative data and the thematic analysis was used to analyse qualitative data.

3. Summary of the results of the data analyses

This section summarises the students' perceptions of transferable skills and work placements, the views of line managers and the DIS (Diploma in Industrial Studies) tutors on the impact of work placements on the development of transferable skills. Also a summary of the results of academic performance of the students who graduated in 2006/07 and 2007/08 academic years is presented in this section.

3.1 The perceived values of work placements

90% of the students who completed the pre-placement questionnaires agreed or strongly agreed that work placements would help them develop their transferable skills but, taking agree and strongly agree as a measure, only 35.5% thought it would improve their grades on return to University, so nearly two third of the sample considered that it would have little effect upon their academic performance.

Two further questions in different parts of the pre-placement questionnaire were asked concerning the specific value of work placement for developing transferable skills. In response to

the question 'is a degree which includes a work placement more effective for the development of transferable skills than a degree course without?' 94% of the placement students said 'Yes' compared with only 67% of the non-placement students.

As a cross-check, the second question asked was "if you were to do (or are doing) a work placement, would you expect it to improve your transferable skills?" All of the placement students agreed with this statement compared with 82% of the non-placement students.

When the students who went on placements were asked (in a post-placement questionnaire) if they think work placements have helped them to improve their transferable skills, 96% of the students who did work placements in 2006/07 agreed or strongly agreed.

An example from the students' qualitative data:

CV03 – "learning and working in the real world is far more beneficial than anything that can be taught at University. You get honours in your degree but that does not mean you will excel outside University. I feel that doing a year out has prepared me significantly for when I do leave University".

97% of the students who did work placements in 2005/06 agreed or strongly agreed.

An example from the students' qualitative data:

CEM16 – "Skills learnt at work can be transferred to other jobs, industries and general life".

Two further questions in different parts of the post-placement questionnaire were asked concerning the specific value of work placement for developing transferable skills. In response to the question 'is a degree which includes a work placement more effective for the development of transferable skills than a degree course without?' All students who did work placements in 2005/06 and those who did their placements in 2006/07 said 'Yes' or 'Definitely Yes'. 94.7% of the non-placement (final year students 2006/07), also agreed.

As a cross-check, the second question asked the students for their views "do work placements have strong or not much impact on transferable skills?" All the students surveyed agreed that work placements have or would have an impact on transferable skills.

There were no significant differences between placement and non-placement students, between genders or between engineering disciplines on these issues. The concordance between these sets of results confirms that almost all students value highly work placements as a means of developing transferable skills.

3.2 The importance of developing transferable skills

The students were asked to give their views on the importance of developing transferable skills. The students were asked this question in both sets of questionnaires (pre & post - placement questionnaires) in order to find out about their awareness of the importance of developing the transferable skills at this stage of their career and see which set of skills they will rank highly than other skills.

Table 3.2: Comparison of the students views on the importance of developing the following transferable skills

Transferable Skills	Pre	Post-placement questionnaires			Grand Mean
	05/06	nWP	WP 05/06	WP 06/07	
Communication skills	5.56	5.32	5.33	5.56	5.45
Ability to solve problems	5.08	5.03	4.77	4.76	4.98
Team working	5.35	5.21	5.00	5.24	5.24
Planning and organizing	5.03	5.07	4.79	4.72	4.97
Management skills	4.59	4.59	4.38	4.20	4.52
Technical skills	4.71	4.63	4.34	4.28	4.58
Personal effectiveness	4.92	4.92	4.55	4.60	4.83
Research skills	4.33	4.18	3.31	3.48	4.04
Information Technology	4.87	4.78	4.51	4.56	4.75
Decision making skills	4.79	5.01	4.79	4.76	4.85
Time management	4.97	5.28	5.08	5.24	5.11

Mean score on 1 – 6 scale: **1** = very unimportant, **6** = very important.

nWP = Students who did not go on placements

WP = Students who did work placements

Pre = Pre-placement questionnaire

The overall majority of students valued work placements highly as a means of developing transferable skills regardless of gender, discipline or if they went on work placement or not. They agreed that it was important to develop transferable skills and, of these skills as shown in Table 3.2, the most important to develop were communication skills and team working, they also rated fairly highly their competences in these skills as well. The skills they rated low (as not very important at this stage of their career) were research skills and management skills.

3.3 The Views of Line Managers and the DIS (Diploma in Industrial Studies) Tutors

Twenty six line managers from 19 different companies which take students on placements took part in the survey, the overall majority (87%) considered that work placements had a strong or very strong impact upon the transferable skills of the students.

An example from the line managers' qualitative data:

LM3 – “They mostly gain an appreciation of how things work/get done in industry. Those who are most able gain in confidence, learn how to work in teams, and learn about how to get their ideas across. Some are able to develop some ideas about how they want their career to develop”.

They believe that work placements increases the confidence and maturity of the students, and when line managers were asked to give their overall assessment of the students they supervised over the last few years, in terms of their transferable skills improvement, they ranked highly the following transferable skills: communication skills, technical and problem solving, team working, and time management. The skills ranked low were management skills, decision making skills, and planning and organising.

93% of the line managers surveyed considered that transferable skills can be developed better at the workplace. But they believe that the level of supervision of the students in industries and the duration of the work experience can be a key factor for the students to acquire and develop their transferable skills.

An example from the line managers' qualitative data:

LM7 – “Yes. However, the level of supervision that the student receives has to be rather high. One major danger is the apathy of certain students towards their personal developments. If the student does not get pushed and stimulated by his/her industrial supervisor, there could be a lack of development during that time. Had a student decided to stay at University rather than doing a placement, he would have been stimulated by project/examinations deadlines etc”.

All line managers surveyed, preferred work placements of one year as it gives the student sufficient time to learn from their experiences and also gives their companies a chance to benefit from the placement. They suggested it takes at least 3 months for the students to understand the systems, procedures and processes before they are able to contribute useful work.

An example from the line managers' qualitative data:

LM10 – “The students benefits the most from having a year placement, their contribution is much higher in the last 6 months compared to the first 6 months. So it is much more valuable to both parties and it can take about 6 months before they really start to positively contribute”.

When the line managers were asked about their suggestions for the alternatives ways of helping the students who are not doing work placements to acquire the same skills as those who have done placement, there were mixed feelings. Some suggested team-based design projects as part of the University course, holiday work, summer work and voluntary work. Some believe that there is no effective substitute to work placements, as the other alternatives might not be as effective as the one year placement.

Five DIS tutors from three departments (Civil Engineering, Chemical Engineering and IPTME) also took part in the survey. All of them agreed that a degree courses which include a work placements are more effective for development of the students' transferable skills than a degree course without. They believe that a degree course which includes a work placement increases the maturity of the students, and thought that the students value work placements as the opportunity to acquire and/or improve their transferable skills, gaining experience and a salary.

An example from the tutors' qualitative data:

T003 – “Because the degree course only, you do not relate anything. Also the degree course which include work placement helps the students maturity”.

When the tutors were asked about the benefits of work placements to the employers, they thought that the employers regard work placements as a recruitment process.

An example from the tutors' qualitative data:

T004 – “Partly trained engineers who in general can quickly fit into a defined role. Training in a company which can hopefully lead to a permanent job. The opportunity for a 12 months interview”.

According to the tutors, the transferable skills which work placements have most impact on to the students were communication skills, team working, decision making and time management. Tutors thought that work placements have least impact on management skills, research skills and Information Technology of the students. Similar to the line managers' views, all the DIS tutors preferred the work placements of one year as it gives the student more time to learn from their experiences.

An example from the tutors' qualitative data:

T002 – “Longer placements are better i.e. 45 weeks, than doing shorter placements, because they get a chance to build more responsibility during the year and have a more responsible job by the time they finish. In short placements, they end up being put into different sorts of works with different jobs, so by the time they know what they are doing it's a time to come back to University, so they do not get the chance to have responsibilities they have gone through the learning bit, but not the application bit. On one year placements, they get to learn the skills and then they get to apply them and some of the students end up running contracts, running projects by the time they finish, which certainly they would not get on three month placement”.

When the DIS tutors were asked about their suggestions for the alternatives ways of helping the students who are not doing work placements to acquire the same skills as those who have done placement, there were few suggestions i.e. summer/holiday work. But the tutors thought that the length of the work experience period is a key factor in improving transferable skills, therefore the short work placements alternatives might not be as effective as the one year placement.

An example from the tutors' qualitative data:

T001 – “I think would have to be something where the students will have to work as a part of the team, but not a team they are use to work with, they will have to sort shuffle people around, and expect that person to operate in the same sort of environment in terms of time management and motivation, in other word you will be creating another work placement I think, in all but different name, but you can do it. You can have voluntary service overseas, that will do it, any environment where the student works individually away from their colleagues, but as a part of a team/another team they are unaware of. I think would probably cover most of those key skills, because IT skills are irrelevant, because it's already quite well achieved before they go, so its these personal effectiveness, planning etc”.

3.4 Students' academic performance

The examinations results of 423 students in total were obtained from three departments: Civil Engineering, Chemical Engineering and IPTME. In 2006/07 academic year examinations results, 110 of the students did their work placements in industries during the 2005/06 academic year and 73 students did not go on work placements. In 2007/08 academic year examination results, 144

of the students did work placements in industries during the 2006/07 academic year and 96 of the students did not go on work placements.

Tables 3.4a and 3.4b shows that the students who went on work placements, achieved high grades (First or Upper-Second) compared to the students who did not go on placements. These results should be treated with caution as the final degrees grades results only, are not enough to prove whether work placements helps the students improve their academic performance.

Table 3.4a: Overall Examination Results 2006/07
(Chemical Eng., Civil Eng. and IPTME)

	1 st	2 nd Upper	2 nd Lower	3 rd	Pass	Fail
Placement Students	24 21.82%	68 61.82%	18 16.36%			
Non Placement Students	6 8.22%	30 41.1%	25 34.25%	2 2.74%	3 4.11%	7 9.59%

Chi-squared Test Chi-squared = 25.667, df =1, p < 0.0004

(The chi-squared test was based on a 2x2 table of first class and upper second results versus lower second and lower results)

Figure 3.4a – Overall Examination Results 2006/07
(Chemical Engineering, Civil Engineering and IPTME Departments)

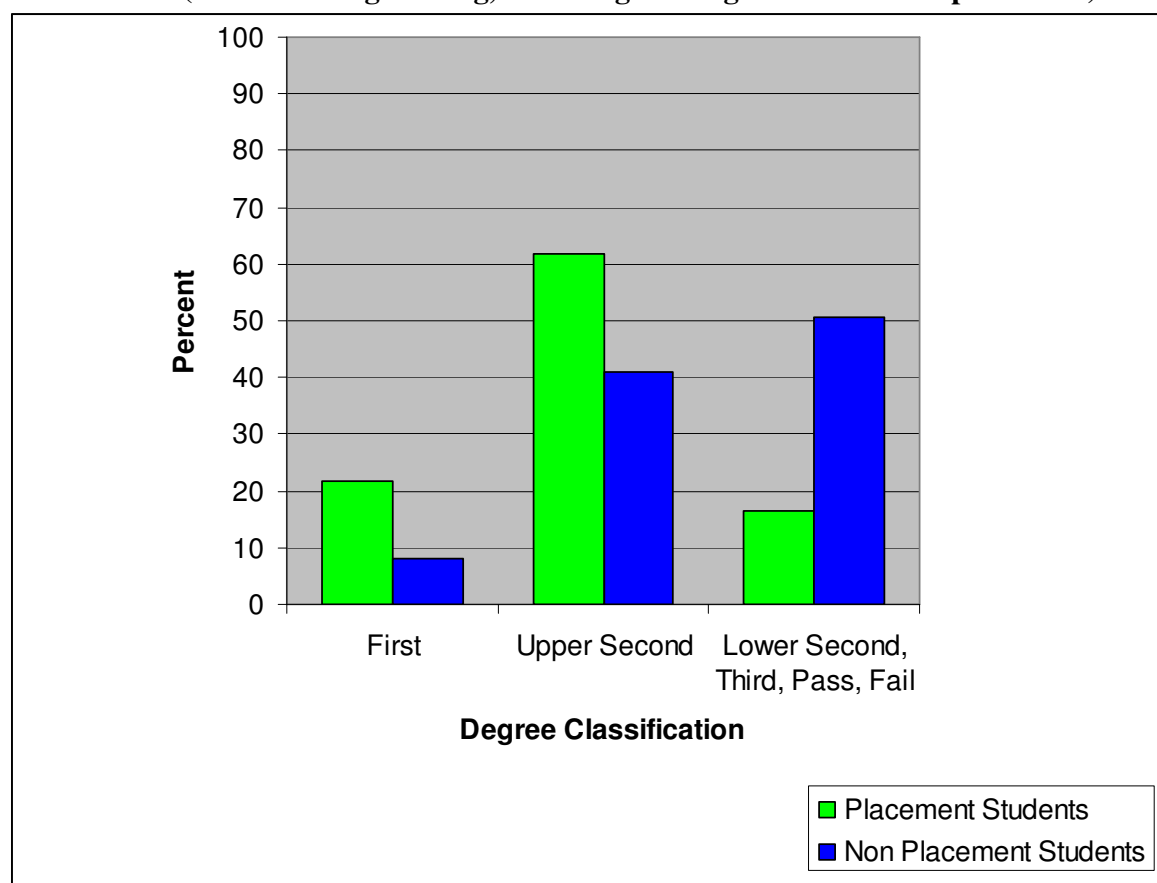


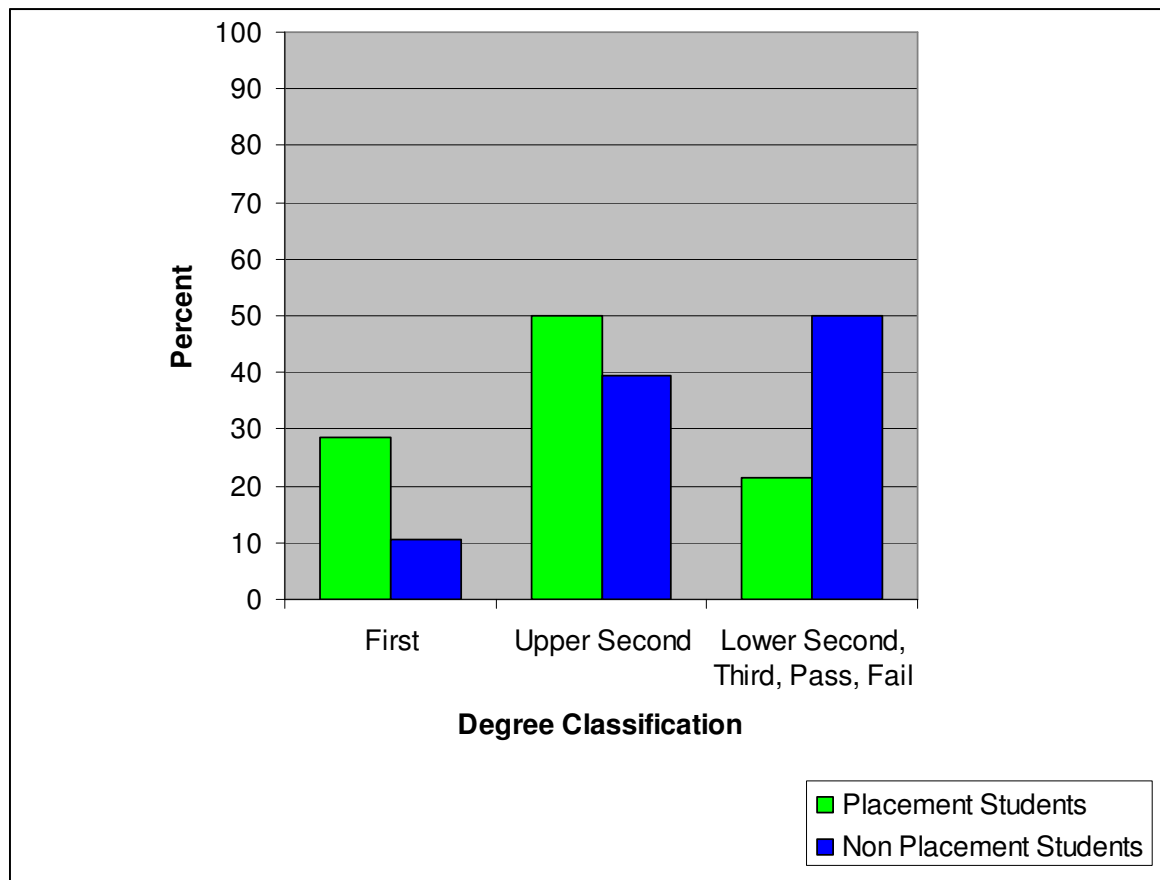
Table 3.4b: Overall Examination Results 2007/08
(Chemical Eng., Civil Eng. and IPTME)

	1 st	2 nd Upper	2 nd Lower	3 rd	Pass	Fail
Placement Students	41 28.47%	72 50%	30 20.83%	1 0.7%		
Non Placement Students	10 10.42%	38 39.58%	42 43.75%	4 4.17%		2 2.08%

Chi-squared Test Chi-squared = 24.386, df = 1, $p < 0.0004$

(The chi-squared test was based on a 2x2 table of first class and upper second results versus lower second and lower results)

Figure 3.4b – Overall Examination Results 2007/08
(Chemical Engineering, Civil Engineering and IPTME Departments)



The above results are in line with the literature published on work placements and academic performance of students, such as the research conducted in the Civil Engineering department at Loughborough University from 1977 to 1984 (Mayo et al., 1985), and research conducted at the University of Leicester (Mendez, 2008). Earlier work by Bournier and Hamed (1987) concluded from a study of 16,662 CNAA (Council for National Academic Awards) graduates that students who had similar GCE 'A' level results but who had completed sandwich placements obtained better degree results than those who did not.

Although these results show that the students who went on work placements were the ones who obtained high grades compared to those who did not do work placements, there are other factors which need to be taken into consideration when drawing firm conclusions. Firstly it was not possible to obtain the students marks for each subject / modules they took from their first year of their degree programmes. This was due to the restrictions on information of students imposed by the Data Protection Act of 1998. Secondly, it was not possible to obtain their 'A' levels grades due to the same reason. Therefore there was no way of finding out if better students were the ones who went on placements or not, as we did not have their examination results from their first year, (the data obtained about the students degrees classifications were published and posted on the notice boards in the departments, so there was no restrictions on these results).

4. Discussion and conclusion

In general, there was a very strong agreement between all three stakeholders, students, line managers and DIS tutors regarding the impact of work placements in developing the students' transferable skills. All regard work placements as the most valuable way of developing transferable skills and despite their reservation, the results show that these transferable skills which are measurable in academic performance do show that work placements have an impact. But some caution is necessary. Transferable skills and their transferability remains a controversial issue. The measurement of impact in this field is more a matter of judgment than precise measurement. The curriculum and work placements may vary in their contributions to the development of transferable skills.

In terms of the impact of work placements in academic performance of the students, the results of the analyses of the data obtained for this research are very satisfying, but they do have limitations and further research is required. The issues surrounding the impact of work placements on transferable skills and academic performance are complex. There is no simple causal relationship between experience gained on work placements and academic performance. We do not have measures of skills prior to work placements except those obtained by self assessment. We have no measures of motivation, readiness to learn or the specific experiences of the students on placement in different workplaces. Consequently, one has to rely upon judgment not measurement. With this in mind, one can conclude cautiously that experience gained of transferable skills on work placements do make a significant contribution to degree performance but other factors may contribute directly to degree performance and indirectly to the development of transferable skills on work placements.

In summary, work placements are valued highly by all the major stakeholders. Work placements are considered to have an impact upon transferable skills and the evidence suggests that work placements, through the development of transferable skills, may influence degree results. Further research is needed in order to find out exactly how the students who are not doing placements can improve their transferable skills.

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