
The Impact of Work Placements on the Development of Transferable Skills in Engineering

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Abstract

This paper presents the initial findings of the pre-placement survey undertaken in three engineering departments (Chemical Engineering, Civil & Building Engineering and Institute of Polymer Technology & Materials Engineering – IPTME) at Loughborough University. It is a part of the research project on the impact of work placements on the development of transferable skills in engineering. One hundred and seven students participated in the survey.

The main results were that the majority of the students had, in their view a solid basis for developing transferable skills whilst on placement. They valued work placement and they considered the work placements would have an impact on their transferable skills. These results provide a baseline for measuring the impact of work placements on transferable skills.

This study will be a longitudinal study of students embarking on their placements, during and afterwards. The results, of the first stage of the research achieved using pre-placement questionnaires, are reported in this paper.

The longitudinal study aims to identify the impact of work placements on the academic performance and the development of transferable skills of a sample of engineering students. This project is funded and supported by the Engineering Centre for Excellence in Teaching and Learning (engCETL) at Loughborough University.

Keywords

Work placement, sandwich placement, summer placement, transferable skills, work-based learning, engineering, skills.

Introduction

This paper provides a summary of the work completed so far for a research project on the impact of work placements on the development of transferable skills in engineering. In this brief introduction, the key concepts are outlined. This paper describes the design of the research and the findings from the analysis of the pre-placement questionnaires completed by 107 students. The questionnaire was concerned with the students' initial perception of the value of work placements for developing transferable skills. This project is funded and supported by the Engineering Centre for Excellence in Teaching and Learning (engCETL). engCETL was established in March 2005, initially for a five year period, and is located in the Faculty of Engineering at Loughborough University in the UK.

How is the impact measured?

The standard method of measuring impact in engineering and in social science is to take measures before and after the impact. This model of pre-test intervention post-test is used in this research. However the measurement of impact in the social sciences and educational is different from measurement in engineering. Whereas in engineering the measurements include precise instruments, in the social science the measurements relies heavily upon subjective measures such as the perception of students, their university/industrial training tutors and their line managers in industry.

In this research project, a variety of quantitative and qualitative methods to measure the impact are being used. These include structured and open ended questionnaire, interviews, focus groups, documentary analysis of curriculum and modules and measures of students' achievement. The core of the overall study is the students' perception and their levels of achievement. The perception of the students will be correlated whenever possible with the perception of tutors and line managers. A control group of students who have not undertaken placements will be surveyed and their results compared with the results of those who have undertaken placements. In this paper the initial results are reported.

What are work placements?

QAA Code of Practice Section 9: Placement Learning provides a broad definition of placement learning: "A work placement is a planned period of learning, normally outside the institution at which the student is enrolled, where the learning outcomes are an intended part of a programme of study."

Whether work placements are planned, have learning outcomes and are an intended part of a programme of study, is a matter to be examined in this project. It may be that not all work placements fit the QAA's code of practice.

Work placements are increasingly regarded by policy makers as beneficial to all students. The Dearing report (1997) recommends that, work experience should be made available to a greater number of students. Work experience does not mean only one year in industry, it can be a three months summer placement, a few months internships (placement in a firm or agency related to a student's major program and/or career plans), a few weeks work-based project or work shadowing (where a student observes a member of staff working in an organisation).

The duration and type of placements is a potential problem with work placements. The various types of placements are: Sandwich placement (paid work in industry which is part of some degree courses), Work-based project (a specific piece of assessed work for a course, undertaken at an employer's premises), Work shadowing (where the students observe a member of staff working in an organisation), vacation work (paid or unpaid work undertaken during University holidays) etc. Clearly these different work placements are likely to have differential effects upon students.

Some of the claims for the value of work placements are as follows: it helps students discover and improve the skills that they will need to use to be successful. For example: planning and organising; the ability to work as a team member; the ability to solve problems; presenting in professional way; motivation and initiative as well as providing an opportunity for students to be able to take what they have learnt and apply it to real problems. Whether these claims actually occur in practice is not at all clear.

What are Transferable Skills?

Some papers define "transferable skills" as the skills that someone has acquired and developed through one situation that are useful when transferred into another (next career), Fallows and Stevens (2000). The DfES (2005) identified six key skills which are: communication, application of number, information technology, working with others, improving own learning and performance, problem solving. In this study a composite of skills drawn from the literature were used. These were *communication skills, ability to solve problems, ability to work as a team member, planning and organising skills, management skills, technical skills, personal effectiveness skills, research skills, information technology skills, decision making skills, time management*.

Are Skills Transferable?

It is often assumed that, once learned, personal transferable skills will transfer from the context in which they were acquired to another; however this may not happen in practice. Brown, Bull and Pendlebury (1997) suggest that in order for the skills to be transferred, the learner must understand the skills *and* the context in which the skills are to be transferred.

Presentation and Discussion of the Results

The following are the analysis of results completed so far.

Profile of students' characteristics

One hundred and seven questionnaires were completed by student from three departments: Civil Engineering, Chemical Engineering and IPTME. Students who completed the questionnaires were 84 males and 20 females and 3 did not indicate their gender. The age range of the sample was from 19 to over 23 years of age. The majority (59) were 20 years of age. Twelve of the students were international, 91 reported they were UK/EU students and 4 did not respond.

One hundred and three students were second years, 1 was an Erasmus (*European Community Action Scheme for the Mobility of University Students*) student and three did not complete this question. Forty nine of the students were from Civil Engineering department, 33 from Chemical Engineering and 25 from IPTME.

Eighty seven students expected to do work placements and 18 reported they are not doing work placements. The majority of students will be doing placements at the end of their second year. Thirty three students had an experience of work in engineering prior to their courses, the remaining students did not. Seventy nine students had other work experience, 24 did not and 4 did not respond to this question.

When asked about the factors which would (or have) influenced their choice of company, 58 students were not concerned about the size of the company, 18 preferred to work in a large company, 26 in a medium company, 3 in a small company. Thirty six students preferred to work near their families. Seventy eight percent of the students gave their ID numbers. These will be followed up in the post placements surveys and interviews.

The perceived value of work placements

Ninety five students (88.8%) said a degree course which includes a work placement is more effective for the development of transferable skills than a degree course without. Nine (8.4%) disagree and 3 (2.8%) did not respond, see Figure 1 below.

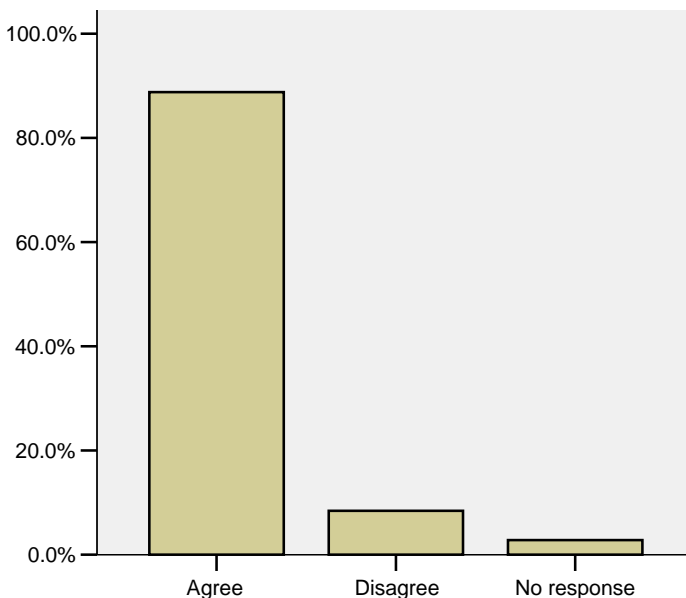


Figure 1: The perceived value of work placements

Students were also asked to rate the reasons on why students go on placement, using the mean and standard deviation, the three reasons rated high were for *work experience, to improve their chances of getting a job when they finish university and to give them an idea of what industry is really like*. This supports previous findings on the benefits of work placements (Harvey et al, 1997; Falconer, S. et al, 2003; Pickle, T. A, 1999) as well as highlighting the students' expectation by doing work placements.

The lowest was because *it is a part of the course*; this item had a wide distribution of views. The next two most lowest were: *they need break from education and because they need money*.

Transferable skills

Students were also asked to give their views on the importance of developing transferable skills. Using the mean and standard deviation the three transferable skills which the students thought were the most important to develop were: *communication skills, planning and organising skills and information technology skills*. The least important were *time management, research skills and management skills*, but even these had a relatively low standard deviation.

The highest rating and narrowest range of responses on students' self assessment of their transferable skills were: *ability to work as a team member, ability to solve problems and planning and organising skills*. These results imply the students feel they are fairly competent but will need some support. The three transferable skills the students self-assessed lowest were: *management skills, information technology skills and time management*. From these results one may conclude, that in the opinion of this sample of students, their experiences at university and earlier had laid a solid foundation for the development of transferable skills which they expected work placements would improve further.

The data obtained from the pre-placement questionnaire shows that, the majority of the sample of students reflects most upon *time management, ability to work as a team member and planning and organising*. It is interesting to note that this frequency of reflection does relate to some of the skills which the students were least confident about. This implies a high degree of reflection and self awareness by this sample of students.

The least frequent transferable skills which were reflected upon were: *information technology skills, communication skills and management skills*. These results may be because these skills do not figure largely in the modules taught in the departments surveyed. Different results would have probably been obtained from a sample of Electronic & Electrical Engineering and Computer Science departments.

It is interesting to note that the students thought communication skills, information technology and management skills were important to develop. In their response to the question which asked them "if they were to do (or are doing) a work placement, would they expect it to improve their transferable skills?" 94.4% believe work placements will help them improve their transferable skills, while 2.8% didn't agree and another 2.8% didn't answer this question. But the responses to the question asking why students go on placements revealed that students do not believe that going on work placement will improve their academic performance. If this is true, then work placements do not have an impact upon academic performance even though successful academic performance is based in part upon transferable skills such as the ability to solve problems, research skills, management skills. Analyses of actual performance in degree examinations will be undertaken and these results compared and discussed with this finding to check if their initial perceptions are correct.

From these results one can conclude that the majority of students had, in their view, a solid basis for developing transferable skills whilst on work placements. They valued work placements and they considered work placements would have an impact upon their transferable skills.

References

Brown, G., Bull, J., and Pendlebury, M (1997), "Assessing student learning in higher education" London and New York, Routledge, Taylor & Francis Group

Dearing, R. (Chmn) (1997), "National Committee of Inquiry into Higher Education (Dearing Report)", July 1997, London Department for Education and Skills

Falconer, S., Pettigrew, M (2003), "Developing added value skills within an academic programme through work-based learning", International Journal of Manpower, Vol. 24 Number 1, pp. 48-59

Fallows, S and Stevens, C (2000), Integrating Key Skills in Higher Education, London, Kogan Page Publishers

Harvey, L., Moon, S., Geall, V. and Bower, R (1997), "Graduates' Work: Organisational Change and Students' Attributes", Birmingham, Centre for Research into Quality, University of Central England

Pickles, T. A (1999) "Relating Curriculum Content to Industrial Placement Experience", Washington DC, WACE Conference Proceedings

Websites

engCETL website, <http://engcetl.lboro.ac.uk/>

DfES (2005) 'What are key skills?' <http://www.dfes.gov.uk/keyskills>