

Networking industry and academia: evidence from FUSION projects in Ireland

Abstract

Graduate development programmes such as FUSION continue to be seen by policy-makers, higher education institutions and SMEs as a primary means of strengthening higher education-to-business links and in turn improving the match between graduate output and the needs of industry. This paper provides evidence from case studies. The findings indicate that the practical application of academic principles in real world settings provides a useful learning vehicle for academics, graduates and SMEs. Key success factors and strategies for overcoming obstacles emerged from the case studies. In light of these findings we make tentative recommendations that will aid the future delivery of similar programmes.

Keywords: Graduate Development Programme; Graduates; Supervisors; SMEs

1. Introduction

The importance of graduate development programmes (GDPs) as a means for facilitating the transition from higher education to a meaningful career is well documented in the academic literature (Garavan, 2007; McDermott, 2006). The perceptions of employers have also been studied (Hesketh, 2000) as has the experience of academic supervisors (Hughes, 2004). In this paper we propose to look at the three perspectives simultaneously. This approach facilitates a three way narrative based in the six case studies conducted during this research. The result is eighteen perspectives on the purpose, process, benefits and challenges of graduate development programmes, specifically the FUSION programme. The findings which emerge offer insights leading to recommendations that will aid the future delivery of similar programmes.

2. Graduate development programmes (GDPs)

Clancy and Wall (2000) argue that higher education policy in Ireland since 1980 has been characterised by a strong emphasis on technology and vocational relevance. The ability of educators, policymakers and business to persuade students in Ireland of the value of a higher education has significantly contributed to economic success. Saunders (2000) outlines the various perspectives that have been used over the last thirty years to explain the nature of the relationship between higher education and industry. A brief description of the change in philosophy is necessary to set the context for this paper. O'Donnell *et al.*, (2001) provide a comprehensive review of the Irish context. With the creation of the Expert Group on Future Skills Needs in the Republic of Ireland and the Northern Ireland Skills Expert Groups (see, www.skillsireland.ie) the needs of the labour market and economic and industrial concerns entered much more explicitly into higher education course design, development and funding. The effective role of higher education is now to provide educated labour that can quickly adapt to the needs of a knowledge economy. This is explicit in policy documents (HEA, 2007; Dept. of Employment and Learning, 2006) which specify the requirement to align higher education curricula and academic activity with the changing needs of industry. One outcome is GDPs such as the FUSION project.

Hesketh (2000, p. 246) explains that recent research investigating industry's satisfaction with graduates suggests that all is not well. Common to both academics and employers is the recognition of the importance of a graduate labour force which

has the requisite intellectual capabilities, and that has the range of *transferable skills* which are more and more demanded by employers. Graduates also have expectations, although evidence from (McDermott *et al.* 2006; Arnold *et al.* 2002) suggests that these expectations do not always match with those of their employers or staff at their academic institution. Graduates too have the realistic expectation that their higher education will support their future development. However, there is evidence that student choice reflects a lack of focused aspiration (Purcell and Pitcher 1996; Purcell 1999; Stephens *et al.* 2007). The connection between development and retention is strong (Garger, 1999). Furthermore, graduates look to their employers to provide them with both formal and informal opportunities for growth and learning. GDPs specifically designed to attract and retain graduates are an example of a formal opportunity for growth and learning. GDPs are provided to enable graduates to quickly translate their academic knowledge into practical application. The benefit to the graduate is career progression, to the employer new knowledge and to the academic the opportunity to apply theory. Okazaki-Ward (1993) suggests the additional objectives of these programmes include challenging the individual orientation of new graduates, developing company loyalty and instilling in the graduate the duties and responsibilities expected of them.

The improved employability of graduates has become an aim of the Irish and British governments. However, no matter how successfully an higher education institution is in providing training and education tailored to the needs of industry, the absence of work based learning will undermine the rationale behind any manpower planning

initiatives. To succeed at work, graduates need to develop a range of personal and intellectual attributes (transferable skills). These attributes/skills are supplements to those explicitly available during study in higher education institutions. Academics through research, scholarship and teaching develop knowledge, which they translate and transfer for graduates to apply and refine. The advent of GDPs challenges the view that the function of higher education is to disseminate knowledge and to enable learners to discuss, analyse and critique this information. GDPs are one initiative that challenges academics to make their knowledge applicable, learners to apply the knowledge and industry to accept the outcomes of the application of academic knowledge.

For employers disciplinary knowledge and understanding are vital. For example, (Adelman, 2001) explains that in the field of information technology, accreditation by major companies is competing with awards from higher education. Furthermore, corporate universities are emerging as part of multinational corporations, examples can be found in Boeing, Motorola and MacDonald's (Hamburger University). For other employers, a generic academic qualification can be sufficient. Purcell and Pitcher (1996) noted that for many years over 40% of advertisements for 'graduate jobs' had been more or less indifferent to an applicant's subject of study. For these employers a refined version of the raw material (labour) is needed as a component (employee) that they will then redesign (train) so that the necessary expertise is available to the organization. GDPs offer the opportunity to conduct this process in a partnership between academics, graduates and industry. The result is a structured

approach to improving the transition from higher education to the modern workplace. There are a wide range of GDPs currently available to graduates on the island of Ireland. Examples include: the Aramark GDP for management graduates; the Teagasc GDP for food science graduates; the Bank of Ireland GDP for finance graduates and the GDP for local government in the UK. In the next section we provide a description of the FUSION project.

2.1 About FUSION

A FUSION project involves an SME that has a particular technology, knowledge or other resource need applying for support, training and general expertise from a higher education institute. There are three unique characteristics of this network: firstly, the partnership must be cross-border, that is, the SME and the higher education institute must be from opposite jurisdictions (Republic of Ireland and Northern Ireland). Secondly, the network must submit a joint application to InterTradeIreland (www.intertradeireland.com). The application typically involves an innovative and collaborative technology and/or knowledge transfer project. Thirdly, an appropriate graduate is recruited who works on-site at the SME under the supervision of an academic. Hegarty and Johnston (2008, p. 397) provide a profile of FUSION projects undertaken during 2001-2007. These projects have involved sixteen different higher education institutions, involved SMEs in twenty seven of the thirty two counties on the island of Ireland and covered eighteen different sectors including: biotechnology; food and beverage; IT; healthcare and renewable energies.

Before a FUSION project commences on-site the company and the academic supervisor attend a training day provided by InterTradeIreland. A separate training day is provided for the graduate. Topics covered during this training include: the role and responsibilities of each partner; the range of tasks to be completed; and the process for evaluating progress and reporting procedures. On-site the first day begins with a four-way meeting. This meeting involves the employer, academic supervisor, graduate and a representative from InterTradeIreland. Following the meeting the graduate commences full-time paid employment with the company. The graduate has to complete a work-plan that has been agreed at the four-way meeting. Typically progress will be reviewed with the academic supervisor either a half day a week or a full day every two weeks. A formal report is sent to InterTradeIreland every three months and upon completion of the project the graduate submits a full report.

3. Methodology

Case study method is among a number of research techniques that has been used in a business setting to improve practice. Traditionally theory has been developed by a combination of experience, observations, reading and anecdotal evidence. Case study method has been widely used as a research instrument for data collection and theory building and policy/programme development (Lewis, 2001; Goffin and New, 2001; Jensen and Harmsen, 2001; Ozelkan, 2007). In this research a case study methodology was used to explore the outcomes of six FUSION projects. When deciding on the number of case studies a balance must be struck between the depth and the breadth of study. Multiple case studies allow the boundaries of the

investigation to shift because the research is essentially explorative. There is no overall consensus on the ideal number of case study companies. The literature indicates that between four and ten works well (McLachlin, 1997; Yin, 1994; Eisenhardt, 1989). Within each case study data was collected under the following themes: data characterising the organisations and its products/services, history of the company, especially reconstructing the process of evolution, performance measures related to the level of the activity under study and enablers and disablers facilitating progress. Tight (2003, p. 188) explains that it is difficult to imagine anyone undertaking a meaningful piece of research, which does not involve some documentary analysis. Therefore, it was essential that sufficient access to company documentation was secured and a review undertaken. Further evidence was collected through multiple interviews with participants who had performed one of the three roles of employer, academic supervisor or graduate. The interviews were taped, transcribed, and superfluous material removed such as digressions and repetitions to assist the analysis. Narrative structuring (Kvale, 1996) was used to create a coherent story of the interviewee's experience(s) of the GDP. Finally, cross-case conclusions were written. The narrative is presented in the next section and recommendations are presented in the penultimate section.

4. Six FUSION case studies

Six companies with a wide variety of organizational characteristics and competitive priorities were selected. The six companies represent the following sectors: manufacturing and agricultural equipment; Information Communication

Technology; boat building; manufacturing and transport equipment; fabricated metal products; and industrial machinery. The project duration was twelve months in one case, eighteen months in three cases and twenty-four months in two cases. Within each case the company supervisor, the academic supervisor and the graduate were interviewed. The projects were in the area of logistics, sales, quality control, certification, new product development and manufacturing improvement.

The graduates typically held a primary degree in an engineering related area. Generally each company had specific entry requirements. Rees *et al.* (2007) suggest six central competencies that employees should use as a guide in the graduate selection process: cognitive skills/brainpower, generic competencies, personal capabilities, technical ability, organization awareness and practical abilities. These competencies link to the skills required by the six employers. The skills included: production management, the ability to work as an individual and as part of a team, experience with design software and 3D modeling, project management, problem solving, presentation and report writing. Therefore, it is important that the selection process facilitates the correct linkage of graduate skills to employer expectations. Employers identified work experience as desirable and important factor in the selection process. Furthermore, the graduates in our case studies perceived work experience as a *winning criterion*. However, the graduates explain that suitable work experience was very difficult to secure. One of the graduates stated that:

‘Gaining work experience during summer holidays is becoming more difficult as a consequence of the economic downturn. In our town a lot of engineering companies closed down or they laid off people recently...’

(Graduate A.)

Further evidence of the need for placements came from one of the academics:

‘I try and place my final year students with future FUSIONS in mind that way you can give them a chance of paid work sooner rather than later...it gives them a better chance of success. Also in our department we are trying to develop *sandwich* courses that have work placement as part of the curriculum ’

(Academic supervisor E.)

Hesketh (2000) points out that graduates seeking work often become frustrated due to a mismatch between employer/employee expectations. Graduates perceived the FUSION programme as an excellent opportunity to gain valuable experience, develop their skills base and possibly secure employment. Although the project objectives were to a large extent predetermined the graduates were continuously interacting with other business functions. One graduate explained that:

‘Throughout the project I worked closely with the marketing and sales department to create a costing system and develop their website. It was very interesting to understand [how] the marketing strategy of the company could be linked to the manufacturing side of the business’

(Graduate D.)

From the companies perspective the graduate, although recruited for their engineering skills are expected to take a cross functional perspective and to use their transferable skills in a range of circumstances. One employer explained that:

‘Tony (the graduate) was a real asset, obviously he understands manufacturing but it was a real help that he could work [with] finance and marketing to keep the focus on overall improvements’

(Employer B.)

The academic supervisors were asked what their expectations were when commencing the FUSION programme and most of them suggested that it was an opportunity to apply their skills and knowledge to *real-world* problems. One academic supervisor stated that:

‘the programme offered me the possibility of networking with company partners for future research and development work. It improved my knowledge of 3D modeling, rapid prototyping and finite element analysis within an innovative company. Although the project is completed, I continue to collaborate with the company and invite them as guest speakers’

(Academic C.)

The research indicated that the transfer of knowledge between the academic supervisor and the company develops into a strong relationship during and post-project. Most of the companies valued their relationship with the knowledge centre and were willing to maintain post project linkages with the academics. Evidence from the interviews highlights the importance of the FUSION programme in providing access to academics and recruiting the right graduates/new employees.

Due to financial constraints the companies in this study seldom use external advisory sources or consultancy services. One employer explained that:

‘our company could not afford to hire a consultant to help us in acquiring the ISO certification. The FUSION project offered the solution. Along with the graduate and academic supervisor, we have achieved this standard and we can approach new customers’

(Employer B.)

The programme also offers the academic the opportunity to continue to work with the company or on the recommendation of the company in the sector beyond the lifetime of the programme. One academic supervisor explained:

‘I never really thought about long term work...but once I had done some other small jobs I got the taste and now I have a lucrative number of projects I do which help keep me up to speed...’

(Academic supervisor E.)

Irrespective of the duration of the project the changing role and responsibilities of the academic supervisor, the employer and the graduate emerged as a key finding from the interviews. For the academic supervisor:

‘My role at the start was very much hands on and towards the end it was more of a mentoring role. As the graduate became more familiar with the processes in the factory and the requirements of the project, there was a definite need to balance the needs of the project to the changing goalposts within the company. At times my role was to act as a conduit/buffer between the zeal/entrepreneurial spirit of the owner and the graduate. This is an understated but extremely important role’

(Academic supervisor F.)

Evidence from the interviews indicates that there is a need for academics to view their role as: a supervisor to the graduate; an intermediary between the graduate and the employer; and a consultant to the company. It is important that the focus of the academic supervisor varies as the project progresses and that they are cognisant of how their activities and input affect each of their three roles.

For the graduate it is important that they have realistic expectations of the GDP. In the six case studies the graduates talked about how the initial stages were not as they had expected. The following quote provides an example of the graduate's experience:

‘at the start I thought I would work in engineering but instead it was a laptop and lots of data...it was good to see the prep that goes into every task...you really see the reason for so many stages and revisions...’

(Graduate A.)

Although there was initially confusion for the graduates, when they reflected on the GDP they were able to see the value of the different activities that they were engaged in and how the activities were part of a coherent development programme. The employers, perhaps based on their experience of working with placement students and in some cases previous GDPs, had a clearer understanding of the changing role of the graduate.

However, the employers were not as clear on their expectations of their relationship with the academic supervisor:

‘certainly the change in the role of the graduate is pretty much what we expected, although it wasn’t as straight forward as we might have hoped...I didn’t think much about the academic he really has helped us not just with manufacturing project but in lots of other business ventures I have... oh and the guest lectures have been great’

(Employer B.)

Based on these two findings there is a need to base the initial training process in previous case studies. This could be achieved by inviting previous GDP participants to attend the training and to relay their experiences.

In addition a variety of ideas emerged from the case studies in relation to how GDPs such as FUSION could be enhanced. We have summarized these into four key findings. Firstly, there is a need to enhance the recognition that the higher education institutes give to the academic supervisors. This recognition may include additional time off and/or additional remuneration. It is important that the recognition is formal and structured. Secondly, there is a need for participants to be aware that their will not be a perfect match between the knowledge of the academic supervisor and the often very specific knowledge deficits of the company. Therefore, additionally training for academics in specialized skills should be incorporated into the work-plan. Thirdly, employers need to assign a staff member for the graduate to report to and ideally this staff member should be on-site for visits by the academic supervisor. Many of the problems we encountered in the cases studies involved poor

communication between the graduate and the employer. The tasks completed by the graduate were communicated to the academic supervisor but not always to the employer. The result was that the graduate felt undervalued by the employer and the academic supervisor spent much of their site visits explaining what work had been completed. Fourthly, employers commented on how overall company targets were often seen by the graduate and the academic supervisor as separate from the focus of the GDP. However, the employers wanted the GDPs to focus on overall targets as well as programme specific outputs. In the next section we make tentative recommendations that would help to enhance the success of future FUSION projects and GDPs in general.

5. Recommendations

Based on the evidence that we collected from the case studies we make the following six recommendations in relation to GDPs. Firstly, it is important that the selection process facilitates the correct linkage of graduate skills to employer expectations. This is difficult to achieve. However, the development of a detailed job description by the employer and the use of appropriate references by the graduate could help improve success. Secondly, and linked to the first recommendation, there is need to develop additional placement opportunities in undergraduate programmes as evidence from this research indicates that participation in an appropriate placement is a key determinant in a graduates employability. This finding supports the work of Arnold *et al.* (2002) and Hesketh, (2000). Thirdly, the focus of the recruitment process and the initial training is on agreeing the project targets and

identifying the role and responsibilities of the graduate, the academic supervisor and the employer. However, there is often a lack of understanding that these roles will change and how this change process will affect the relationship between the three parties. Therefore, training for GDPs should use guest speakers and case studies from previous programmes so that the participants fully understand their evolving roles and the outcomes they can expect. Fourthly, the relationship between the academic and the employer is too focused on the performance of the graduate. The aspirations for this relationship should receive substantial attention as our research indicates that the benefits of nurturing a successful network between industry and academia are substantial. Fifthly, there is a need to have an effective communication process. In five of our case studies the graduate communicated with the academic supervisor who communicated with the employer. This caused significant problems for the graduate who felt undervalued by the employer. Furthermore, the employers were unaware (and therefore, critical) of the workload of the graduate. We recommend that the graduate report to a single staff member at the company on a weekly basis, with a report circulated to all parties. Finally, to ensure the maximum outcome we recommend that targets for graduate development are successfully supplemented by the targets for the overall performance of the company. It may be beneficial for this matter to be discussed and targets agreed at the first meeting of the three parties.

6. Conclusion

Bensimon *et al.* (2004) argue that essentially, solutions for closing the gap between research and practice involve two issues. Firstly, there is a need to study problems that are of greater relevance to policy-makers and practitioners. Secondly, there is a need to broaden the ways in which research findings are disseminated. Therefore, in this paper we have presented recommendations which are of use to employers, academics supervisors and graduates involved in GDPs. GDPs such as FUSION continue to be seen by policy-makers, higher education institutions and SMEs as a primary means of strengthening higher education-to-business links and in turn improving the match between graduate output and the needs of industry. There was general consensus among the participants that the FUSION programme was bridging the gap between theory and practice, allowing academics to collaborate with local industry and transferring knowledge to graduates. The findings of this study indicate that the practical application of academic principles in real world settings provides a useful learning vehicle for academics, graduates and SMEs. However, there is evidence that the GDPs can be improved resulting in an enhanced experience for the graduate, academic supervisor and the employer. The improvements involve changes to the recruitment process to ensure an appropriate match between graduate and employer. Each of the three participants need to be briefed on the variety of roles they have to undertake and that the nature of their roles will change during the GDP. Finally, there is a need to focus on the relationship between the academic and the employer so that the potential for networking industry and academia is maximised.

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