

INDUSTRIAL BRIEFS FOR STUDENT PROJECTS – A COMPANY PERSPECTIVE

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ABSTRACT

The use of industry collaborative projects is clearly widespread across Europe, America and Australia, in particular, and much has been written about the use of industrial or ‘live’ briefs for undergraduate projects within design and engineering courses in Higher Education. Generally, these papers have understandably concentrated on the learning experiences, benefits and difficulties from the perspective of the undergraduates working on the project. There is evidence of a ‘growing interest’ from companies in being involved in these kind of projects. However, the drivers for the industrial partner to desire to become involved with a higher education design project have a significant impact on that project.

Thus, this paper focuses on industry collaborative projects from the perspective of the industrial partner. The paper is based on the experiences of one industrial partner working with two HEIs using a shared project brief over two academic years. The paper discusses the drivers from the perspective of the industrial partner regarding the desire to offer such a brief in the first instance and then expand the collaboration to include a second HEI and on the perceived benefits of such a collaboration. The study reports on a number of interviews with different stakeholders within the industry partner and HEIs involved.

Keywords: Industrial collaboration, design projects, ‘live’ briefs, industrial briefs

1 INTRODUCTION

Clearly industry/academia collaborations can be initiated in many different ways. The collaborations reported on in this paper are the result of a member of staff at Nokia becoming a Royal Academy of Engineering (RAEng) Visiting Teaching Fellow at London South Bank University (LSBU). RAEng Visiting Teaching Fellowships seek to

“... enrich the engineering curriculum and education experience by placing engineers in universities who are still very much hands-on practitioners and can relate and apply teaching material to the operational issues and real-life problems that graduate engineers may face when they first enter industry.”[10]

The member of staff was an alumni of LSBU and was approached by LSBU to become a RAEng Visiting Teaching Fellow. The Fellowship commenced in December 2009.

Since this time the Fellowship has involved industrial based projects, mentoring students, critiquing projects and supporting the staff at LSBU on average 1 day per month. The experience is deemed to be invaluable by the Fellow as it allows the development of management skills in the area of planning, presentation and decision making and raises the profile of the employer in the all important youth market. The work has developed to include further joint projects with LSBU and Bournemouth University (BU).

2 LITERATURE REVIEW

The use of industry collaborative projects is clearly widespread across Europe, America and Australia, in particular, and much has been written about the use of industrial or 'live' briefs for undergraduate projects within design and engineering courses in Higher Education. Dyer et al [1]; Eriksen et al [2]; Eriksen [3]; Liem [4]; de Vere [5]; Dong & Turnock [6] all discuss the use of industrial briefs on various product or industrial design courses. Generally, these papers have understandably concentrated on the learning experiences, benefits and difficulties from the perspective of the undergraduates working on the project. Eriksen et al [2] (2010) while acknowledging their survey was focused on education staff reports on an article published by The International Council of Societies of Industrial Design (ICSID) that indicates a 'growing interest' from companies in being involved in these kind of projects. Brietenberg, President of ICSID, discussing the situation in the USA, outlines the benefits for the company as -

"First, companies gain crucial advance market research, by which I mean research 5 to 10 years in the future, through working with young student designers, often in their early 20's. These students can anticipate upcoming trends because they are often more attentive to where things are going. And they often represent the same demographic the companies are targeting. Second, design students are still outside many of the constraints and pressures of the marketplace and the corporate hierarchy. This allows them to engage in "blue sky thinking" that corporations really need but have difficulty doing themselves. Of course design students still need to be aware of the marketplace in their work, but they have a lot more freedom to take risks, even to fail, which is one of the keys to innovation. Third, companies can use the sponsored education project as a way to identify young talent and to improve their recruitment process." [7]

However, as Liem [4] discusses how the drivers for the industrial partner to desire to become involved with a higher education design project have a significant impact on that project. He reports that in the Norwegian context in 07/08 and in 08/09 all collaborators in studio projects contributed financially. He also reports that "industries at the end of the value chain, closest to the end-user and usually belonging to the service sector, played a more important and active role in supporting educational collaboration." Thus, he concludes that these collaborators are looking for new design concepts which they can take to professional designers for development. Clearly with payment involved and new ideas being generated the potential for Intellectual Property issues is raised. This related issue was partially addressed by Eriksen et al [2] who suggested 3 models for collaboration, and further by Glasspool [8] in another paper submitted to this conference.

Thus, this research addressed the question – What are the drivers for industry in the UK being involved in Higher Education design projects?

3 METHODOLOGY

A qualitative methodology was used for this piece of research because it was necessary to obtain rich data related to people's perceptions and Semi-structured interviews and focus groups were chosen as the data collection method to enable an exploratory approach to be taken while maintaining consistency. Interviews or focus groups were conducted with participating students at both universities using the same set of questions. Interviews with employees of Nokia were conducted; each interview lasted for approximately 30minutes.

Five employees of Nokia were interviewed. They were chosen because they held a range of roles with Nokia and, therefore, would be expected to hold different perspectives on this project. All interviews held with employees of Nokia were based around the following set of questions:

- Can you describe your role in Nokia?
- What relationship do you understand Nokia has with HEIs?
- What kind of engagement have you had with HEIs?
- Why do you think Nokia should have any involvement with HE?
- What do you think the nature of the involvement should be?
- What do you think Nokia might gain from such involvement?
- Why might you encourage staff to be involved with HE?
- What might this engagement look like in the future?

19 students were interviewed or involved in focus groups at both universities. The interviews/focus groups with students were held in a face to face environment at their respective University and were based around the following set of questions:

What do you think Nokia got out of this project?

Why do you think Nokia offered this type of engagement?

What would you like Nokia to offer as engagement in the future?

Did you change the way you worked because you were working with an industrial partner?

All participants were briefed in advance about the nature of the research and gave their permission to record the interviews and for the data to be published.

4 THE PROJECTS

As noted in the introduction, the first collaboration became a reality through the RAEng visiting Teaching Fellowship scheme being operated at LSBU. As the primary mode of operation of design teaching is through project engagement, it seemed ideal to commence the Fellowship with an industry-based project that was carried out in the spring and summer of 2010, aimed at giving second year product design students a group project with an industrial client.

The brief for this project had been developed from a conceptual thinking away-day held at Nokia. This identified several conceptual ideas that were deemed to be interesting possibilities but were deemed to be crucial for immediate company well-being. This meant that investigating them was not really something that Nokia wished to invest in heavily, but they nevertheless formed interesting directions that the company might be able to explore. Taking one of them forward as a student project meant that a range of conceptual ideas could be presented to the company who were then able to see whether any had more specific development potential.

This initial project took place in two parts. The first part was to investigate brand perceptions for a range of companies. In the second part of the project, groups of students were developing concepts that reached the stage of a physical model. A second project, with approximately the same project brief, continued with MSc students in Design and Manufacturing Management in the autumn of 2010. These students were working independently to achieve essentially similar concept models as the first students, but as they were graduates with engineering first degrees this meant that the design focus of their solutions and their product design approaches were significantly different from those from a Product Design undergraduate course.

In academic year 2010/11 BU ran a collaborative project, again with approximately the same brief. This meant that groups of students at both universities had the opportunity to work independently on the same project brief and the best groups from each university may have the opportunity to undertake some further development work with Nokia designers and engineers.

At BU the project ran with second year BSc Computer Aided Product Design students commencing in December 2010 and completing in late February 2011.

A further collaborative project is taking place for second year students at LSBU in the spring of 2011, but with a different brief. This brief has originated from discussion between Nokia and the University, but essentially has developed from ideas put forward by a BU placement student working at Nokia.

5 RESULTS & CONCLUSIONS

5.1 Students

5.1.1 LSBU

Students who had participated in one or other of the LSBU projects were interviewed individually using a combination of taped interviews and phone conversations. There was a spread of students, a mixture of masters and undergraduate and from several different backgrounds and former educational experiences. Students gave several reasons why they thought that an industrial company might have engaged with this sort of project. These fit into a number of categories. There were those answers that were related to generating a workforce. This area ranged from specific identification of individuals who might be interested in working for them, to generally seeing if they could influence how students developed for the good of the economy more generally. Another category for comments was that they could gather a large variety of ideas and see different examples of ingenuity: students could be their eyes and ears, providing a variety and range of ideas. There were suggestions that it was cheaper to get ideas from students than from in-house research and, similarly, that it was easier than doing the job oneself. Students also felt that Nokia could make relationships with Universities in this way and that they could be in a position to evaluate different universities better as a result: both in terms of the

suitability of the student output for employment and for research expertise, and that this could improve the company image in general.

Perhaps on the negative side, some students felt that the concept work they were doing was too general and would have preferred to have been working on something that was closer to a directly marketable product; they felt that it lacked some immediacy and would have preferred to have some more information about the technologies that were currently used: they found it difficult to get a handle on a specific brief. Some of the more engineering students wanted projects to be exclusively in their areas, such as mechatronics or electronics, and thought that exposure to company laboratories would have been beneficial to them: perhaps a field trip could have been organised.

In terms of what might be possible in the future, some felt it would be too easy to forget such a short project and there was support for a longer project, perhaps including the development of a functional prototype, and for a variety of approaches such as a mixture of group and individual work, with the brief developed in conjunction with the individual. Perhaps most interesting and innovative suggestion was the thought that a permanent group of students could become a think tank, providing ideas and feedback on a regular basis.

Did the project make a difference to the way that students worked? This question provided a great variety of answers, from two students who said that it made no difference at all: one of these qualified his answer in that he meant that it wasn't his intention to change as if he had done that the company would have had ideas that didn't represent the real 'him'. Another who said that he hadn't really tackled such a design exercise before, so he had no benchmark to judge it against. From this perhaps extreme end there was a graduation to one who said that it moved the motivation from a focus on marks to an emotional and personal involvement. What the educators had ordered, perhaps. Other comments were that the inclusion of an industrial partner meant that students concentrated on making sure that the product was functionally achievable and realistic. One student termed this as "less pie in the sky ideas and fewer skyhooks to support it". Some students felt that they researched costings more thoroughly than they might have otherwise done. They appreciated the industrial feedback provided by Nokia staff.

5.1.2 BU

Audio taped data derived from the student focus groups at BU was analysed. Students had a clear understanding of why Nokia engaged with student projects and without exception each focus group identified two central dynamics in relation to this. Firstly, that it was used as a means for in-depth "direct market research". This is based upon the students considering that they represented a typical Nokia customer and because of this and their product design background they were more likely to propose product solutions that met the needs of Nokia's target market. Secondly, they identified that, as students, they were in a privileged position and had the luxury to be able to offer design solutions to the company that one of its regular designers might feel was inappropriate because s/he had a preconditioned mindset because of having worked in the organisation for sometime.

One student focus group identified a third reason for the company's participation and suggested that it gave the organisation the opportunity to identify individuals that might be employed at sometime in the future.

From an academic perspective, each of the students recognized that the industrially based project assignment set by the company had given them a greater incentive and a higher commitment to their work than projects which are normally set by the university. They identified the main reasons for this is because of the project being industrially relevant and "less constrained".

The assignment set was a group based project where the respective teams agreed individual tasks for each of its members and it was clear from the focus group discussion that many of the students identified that their learning had improved significantly through involvement in the project. Generally, they considered that this was because they were working with peers whose skills were better developed than their own with particular aspects of the project. This suggestion, aligns with the plethora of writings related to Vygotsky's [9] idea of the zone of proximal development in which it is recognised that an individual's learning is developed beyond that which they could achieve alone by working with "more capable peers".

5.2 Industry

The interviews with Nokia employees were held on one day at Nokia with two exceptions as employees were not available. One of these was held via teleconference and the other on a separate occasion. All interviewees were positive about increasing engagement with students and HEIs; however, the ways in which this might happen tended to reflect their current experience.

For example undergraduate placements are offered in some areas and these are felt to be beneficial to the company by bringing young people with fresh ideas into the workforce and also being a possible mechanism for informal graduate recruitment, with both placements and projects giving the company better opportunity to see the way students work than a more straightforward interview session would. In areas where placements tend not be offered the idea of projects at various levels that could be offered based on work that was not business critical but nevertheless would be beneficial to the company. These could vary from group undergraduate projects and postgraduate projects that form part of taught modules, through individual final year projects to more research-focused Masters projects. Again, the concept of new, fresh ideas, not contaminated by knowing too much about what is possible or what are the business constraints were perceived as benefits. A number of interviewees also mentioned they would support staff visiting HEIs to offer workshops on portfolios, presentations, visiting lectures and in one example external examiners; here it was perceived it was less about a tangible benefit to Nokia than to assist the next generation of designers and engineers and to act as personal and professional development for the staff concerned, demonstrating that they were able to develop their own abilities beyond those that were required simply for the job in hand. Other comments included devising some form of relationship so that graduates could come better prepared for the world of work, with a better appreciation of business issues for example. Almost all interviewees spoke of the low turnover of staff at Nokia possibly leading to stifling of creativity and engagement with young people in HEIs being a counter measure. Engagement with academics at HEIs tended to be seen as engaging with research and the general response was that Nokia worked with a few selected HEIs in USA and Finland for this kind of work. Some staff were aware of these links that other company centres had with HEIs in other countries: others less so.

One interviewee suggested that Nokia should have links with every UK HEI that offers Product Design courses, but that this would in practice be impossible as there is only a finite amount of time and resources available. He felt that it was a general mark of a forward-thinking company that it should have staff who were prepared to reach out and go beyond their current comfort zones and that this was a way in which they could develop and demonstrate their management potential. There was a feeling that a more structured approach within the company might be beneficial for all concerned, and it could have more of a training infrastructure to it. Only one interviewee mentioned the issue of intellectual property (IP) and that this might need to be considered when engaging with collaborative work. Also, perhaps slightly strangely, only one interviewee mentioned that one of the significant benefits to Nokia was that the company profile would be raised and it would be perceived as an innovative and forward-thinking company.

One person took the last question as being an opportunity to dream dreams and think 'what if?' rather than to simply see whether the existing approaches were adequate. This produced perhaps the most far-reaching comment, similar to one that came from the students: the development of a permanent 'breathing hub' or think-tank approach, provided funding considerations could be overcome and the benefits clarified for all parties involved. This could act as a sounding board for ideas and inventions and at the same time provide considerable experience for both staff and students involved.

6 CONCLUSIONS

From the industry perspective, collaborations provide the opportunity to meet students and to present relevant information about the way industry works to them so that they can be far better prepared and so that when industry wishes to recruit, there is a larger pool of recruits that are able to engage effectively with the community of practice that is carrying out real product design work. Collaborations also tend to raise the profile of the company and present a forward-thinking, innovative approach. They also provide the company with the opportunity to test out ideas that may not be perceived as being of immediate commercial relevance, and keep them in touch with a set of fresh-thinking individuals who are relatively untainted by the limitations of having worked within the company for a lengthy period. This study did not set out to explore the challenges that can hinder such collaborations, however, clearly time factors for employees engaging with academia was a comment

made by a number of respondents. It was also noted that issues around IP could be considered a barrier to collaborations. It should also be noted that collaborations such as the one discussed in the paper require careful management and leadership by academic staff at the HEI involved. In many ways it is considerably more challenging and time consuming to operate a design project in collaboration with a company, particularly, in ensuring academic learning outcomes are met, than using a brief determined purely internally to the HEI.

These conclusions are based on the view of one case study company. In order to determine the nature of further collaborations between HEIs and industry in the UK it will be necessary to conduct similar studies with a wider variety of UK based companies. The drivers identified in this research do not concur with Eriksen et al's [2] findings and thus it may be necessary to identify further models, as Eriksen et al in fact suggest. Eriksen et al [2, p470] also report that the models have been adopted in guidelines by the Educational Board of Danish Designers and it is recommended that professional bodies in the UK might be involved in developing similar guidelines for the UK product design and engineering design professions.

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