BRIDGING THE GAP BETWEEN AIMS AND OBJECTIVES FOR BUSINESS CLIENTS AND ACADEMIC COURSE PLANNERS IN 'LINKED' LEARNING PROJECTS

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ABSTRACT
Creating learning experiences for students in higher education that have a basis in real world practice provide the opportunity for 'significant' learning. In addition 'linked' learning projects help business partners to understand the graduate attributes that are being developed on university courses and provide an opportunity to influence that development. Innovative practice, fostered in the safety of a learning environment, can emerge through positive collaboration between real world clients and university teams and there is the added benefit of contributing to professional development for academics in maintaining currency.

This paper reviews the characteristics of 'linked' learning projects from knowledge based, restrictive and didactic learning scenarios to significant learning, participatory action research projects based on current teaching and learning theory and describes the aims, outcomes and challenges for lecturers and clients. Specific examples of 'linked' learning projects are provided in relation to the students, the academics and the business clients and the outcomes considered in terms of meeting expectations, quality of the learning experience (in line with current theory) and management issues. Conflicting aims and objectives are highlighted and recommendations for bridging potential gaps between the partners' understanding and expectations are suggested. These provide starting points for an understanding of the drivers for learning for projects that will potentially reduce disappointment for clients and students and stressful organisational difficulties for lecturers. The aim is to contribute to positive, significant learning experiences that enhance the collaborative relationship between business and university partners.

Keywords: Real world projects, significant learning, professional practice

1 INTRODUCTION

A university education aims to enable an individual to be a productive member of society. The economic necessity of earning a living has been linked to the expectations of undergraduates and employers alike and the influence of employers formally recognized through programs such as the UK Enterprise in Higher Education initiative [1] in the nineties that identified the transferable skills that employers were asking for in graduates and supported initiatives to promote those skills. Kemp (1995) noted that: 'Personal transferable skills have been placed on the higher education agenda, both by the recognition that there is the need for a flexible, adaptable workforce as we move into the twenty-first century, and by the requirements of both employers and students that graduates can make an immediate contribution to any job situation.' [2]

The needs of the potential employer have therefore been recognised as a contributory factor to the development of learning activities in higher education. Industrial design is a university discipline that is directly related to professional practice and there are expectations (voiced by professional bodies such as the Chartered Society of Designers, UK and the 'voice of professional design' in Australia, the Design Institute of Australia) by the profession that students will graduate with a level of understanding that is comparable with professional practice and allow them to contribute to working practice and the necessity of economic success of an organisation. Only by communication and collaboration can academia and the industrial design profession ensure undergraduate programs stay

current to working practice in the discipline and innovation for the future development of the discipline is understood and supported by employers of industrial design graduates. Projects developed with 'real world' business and industrial partners provide opportunities for those links.

2 'SIGNIFICANT' LEARNING AND 'REAL WORLD' COLLABORATION

An ongoing understanding of current teaching and learning theory is integral and essential to being a professional lecturer. The majority of universities now require their staff to undertake a post-graduate certificate in teaching and learning in higher education and part of professional development is dedicated to developments in teaching and learning. Through the study of education, an understanding of effective practice has been gained by professional academics that began with Bloom et al's 1956 [3] taxonomy of learning and has now developed to student-centred learning characterised as a qualitative change in perception [4].

'Linked' learning projects [5] that are worked on in collaboration with 'real-world' partners external to the university provide a means for students to take a responsibility for their own learning that creates proactive learners rather than dependent learners. This approach to project work has the possibility of providing more 'significant' learning opportunities for the students. Fink describes 'significant learning' by 'The central idea of this phrase is that teaching should result in something others can look at and say: That learning experience resulted in something that is truly significant in terms of the student's lives…In a powerful learning experience, students will be engaged in their own learning, there will be a high energy level associated with it, and the whole process will have important outcomes or results…they will clearly have changed in some important way.' [6]

Projects that are seen as having a purpose beyond an academic exercise set by lecturers change the balance of power, creating a role for the academic as facilitator and supporter for the student, rather than authoritative. The essential change that Weimer [4] identified as the priority for student-centred learning was this shift in the balance of power in the learning experience from the lecturer to the student: 'Students' motivation, confidence and enthusiasm for learning are all adversely affected when teachers control the processes through and by which they learn…teacher authority is so taken for granted that most of us are no longer aware of the extent to which we direct student learning'.

'Real world' projects, in which the student has an investigative role, rather than a passive role as the recipient of knowledge, challenge the student to apply the research they undertake as part of the project work in a situation where the validity of the work is tested through client feedback or consumer use, rather than by the conjecture of the lecturer. O'Brien et al stated: 'Courses *(in student centred learning)* are assignment centred rather than text and lecture centred. Goals, methods and evaluation emphasis using content rather than simply acquiring it.' [7]

Factors identified for successful learning – wanting to learn, taking ownership of the need to learn (including setting targets), learning by doing, learning through feedback and making sense of what is being learned through reflection [3] - can be effectively taught through the use of industry partners, but only with a shared understanding that prioritises the student experience. This is not always practicable with the 'real world' opportunities offered to university design departments. In particular, the challenge in designing learning activities that are connected with real world clients and projects is in allowing for the student ownership necessary for successful learning, and the opportunity for learning by doing, and yet to be allowed to fail through the process in order to move forward.

The leading international design consultancy, IDEO, highlights 'embracing experimentation' as one of the traits for a successful company explaining that 'if experimenting is part of your culture, you can respond…fail often, to succeed sooner' [8]. The valuing of learning through mistakes as a positive process is essential for education, but only possible within a business that has this approach embedded into its working practice. It is not an approach that can be expected as a one-off for an individual project with an organisation that does not have collaborative links with a university department and does not have an understanding of the teaching and learning drivers that govern the curriculum and are essential to the creation of student-centred learning activities.

2.1 Stakeholder expectations

In 'linked' learning, real world projects there are different stakeholders; students, academics, university, industrial partners, business clients and co-workers (people working with the students during a project, either making their designs or working in teams). The challenge of creating successful, collaborative 'linked' learning projects is in meeting the expectations for all stakeholders.

The experience should ideally be part of a two-way process where academia and industry feed each other through long-term partnerships. Part of the preparation for meeting the expectations of stakeholders is in sharing the drivers for participation by all involved so that unrealistic expectations can be addressed prior to the project starting. Business and industry expectations are often expressed as part of development of the brief, but the underlying teaching and learning drivers are often not vocalised as part of the outcome expectations expressed by the university. Providing an understanding for the basis for developing 'significant' learning experiences to industrial and business partners promotes positive collaboration.

3 IDENTIFYING THE LEARNING OBJECTIVES FOR 'REAL WORLD' PROJECTS

There is a range of opportunities for learning experiences that involve 'real-world' practice and address aspects of student development across discipline specific understanding through to transferable skills that meet graduate attribute requirements for undergraduate courses. These cover the spectrum of learning experiences from constrained participatory levels in projects that are essentially production based, through working with, for example, manufacturing suppliers on student-led projects, to professional practice work experience opportunities, competitive briefs set by industry or business partners and participation in commercial practice projects, such as with a consultancy based within the university department.

'Real world' projects provide an opportunity to engage the student in meaningful design practice. The danger of an applied degree such as industrial design being taught in a university – particularly one involved in high level research that might employ theorists over practitioners – is ironically that the projects the students are engaged in can become divorced from the opportunity to be involved in meaningful activity research. Take, for example, the 2010 edition of the Electrolux Design Lab competition that focused on creative solutions for compact living that attracted some criticism (e.g. web review [9]). The brief asked industrial design students to consider how people will prepare and store food, wash clothes, and do dishes in the homes of 2050. How can a student engage in meaningful activity research for the future-based aspects of that brief? Or even the much vaulted design projects for the 'other 90%', such as the 2010 INDEX challenge [10]: designing for education for third world countries? Without providing students with the opportunity to visit the country of their target market, how can they genuinely engage in research for it? Industry linked projects ensure that academia stays realistic, allows for meaningful research and also engages students in the nuts and bolts of the profession.

Creative practice tends to be the focus of publications about product and industrial design. Certainly strategies for creative thinking are essential components of an industrial design course. However, design thinking, defined as the ability to redefine a problem based on initial research and plan strategies for addressing the issues identified is arguably far more vital. The majority of industrial design professional practice is not about creativity, but is based on iterative, cumulative process-led development work built on thorough research and testing at each stage of design development. In publications, tends to be described as an engineering approach: 'Engineering design is a systematic, intelligent process in which designers generate, evaluate and specify concepts for devices, systems, or processes whose form and function achieve clients' objectives or users' needs while satisfying a specified set of constraints.' [11] The reality of industrial design work is developing the effective production of practical designs within challenging and changing manufacturing environments. Keeping students up to date with the latest technology and manufacturing processes and the latest developments in materials in order to work in a range of manufacturing environments is partly mitigated by collaborations with industry partners that allow for a flow of information between industry and academia. Similarly, it is important that industrial partners are invited to attend conferences that explore the break-through innovation in technologies and materials, such as the recent Rapid Product Development conference on additive manufacturing in New Zealand, to enable a free flow of information on innovation back from academic research into the professions.

These are the challenges facing the course planner and lecturer. How to keep the learning current and related to real world context, how to make sure the students have an effective, working knowledge of current practices and new developments, how to help the students to understand the implications of a new technology for their role and finally how to ensure that students have the confidence and ability to keep learning after graduation. These points form the basis of the design of the learning experience

for the student and impact on the decisions academics make about the introduction of 'real-world' projects into course units.

3.1 Constrained participation projects

These are projects that have a 'real-world' basis but limited depth of learning opportunities in relation to student-centred learning objectives. The benefits for student learning are in providing a low risk activity that has a 'real-world' outcome. This outcome provides an initial motivation for the student and moves the authoritative role from the lecturer to an external professional and their client, but not to the student themselves. These projects provide a realistic experience of meeting deadlines, meeting cost restraints, working to a fixed, narrow brief and dealing with manufacturing and suppliers.

In a project that is not design led, that is the parameters create limitations that the student has to work within, the outcome will be derivative rather than based on situational design thinking. Derivative design development work and situational design development work require different thinking and result in different outcomes – both in terms of the finished product, but also in terms of the understanding of the learner. The way this happens is based on the way the brief is presented and how the outcomes are defined – and assessed.
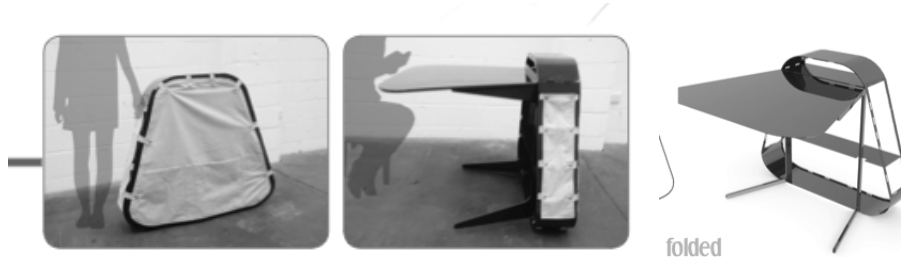

Figure 1. 'Real world' example 1: Collaborating with a manufacturer (Kaup 2010)

For this project the student's interaction with the 'real world' partner was formal and predictable. The student was assigned a collaborative partner to provide the student with the opportunity to develop an understanding of a particular material and associated processes. The student consulted with the manufacturer during design development and worked directly with the manufacturer to create a prototype of the final design. From the 'real world' partner's point of view, the student operates in a limited environment in a controlled manner with predictable outcomes. It therefore contains less risk and requires less understanding of teaching and learning practice as the focus is on general professional practice. These projects are particularly valuable for developing skills relating to graduate attributes. These attributes not only cover discipline specific understanding and workplace skills, such as team working, but also include ethical practice, cultural sensitivity and sustainable practice (e.g. Griffith Uni.). Race, writing in 2007, notes 'It is now increasingly accepted that the most important outcomes of education and training are about developing people, and not just what people know or understand' [12]. Preparation for these projects should focus on transferable skills for professional practice, for example, meeting deadlines, consistency, working to budgets, communicating effectively. The limitations of the learning experiences involved need to be clarified for all stakeholders and reflected in the assessment.

The positives for these types of projects are that the employer role is clearly defined and the outcomes are predictable and can be controlled throughout the process. For the student, these projects provide an introduction to working with 'real world' partners in a controlled environment that has low risk attached to it. The negative is the limitations of the projects in relation to creating proactive, lifelong learners who will have the confidence to innovate and change professional practice in the future.

Ramsdon notes that 'learning should be seen as a qualitative change in a person's way of seeing, experiencing, understanding, conceptualising something in the real world – rather than as a quantitative change in the amount of knowledge someone possesses' [3]. Constrained participation projects allow for valuable experience in specification and management of production and installation, but do not provide the opportunity for a qualitative change in the students' ways of seeing, experiencing, understanding and conceptualising something in the real world. For a qualitative change, a shift in the role of the student to a more authoritative role is required and the project framed to allow for situational design thinking and development with process over product the assessment performance criteria.

3.2 Situational design briefs

To create a 'real world' learning experience for designing that would effect a qualitative change as suggested by Ramsdon, the instructional basis would need to change. O'Brien et al in 2008 stated: 'Successful courses balance the challenges to think critically with support tailored to students' developmental needs' [7]. Situational design learning is essentially design project driven. In these projects the students take the lead in the design direction, management and development of the work. The lecturer becomes the facilitator. This does not mean, however, that the student is totally self-directed. The lecturer provides a framework for the student to work within that supports a design process that includes initial research, directed research (including technical research) and design development. Students are encouraged to develop their ideas beyond the constraints of a derivative brief, by considering the situation that has prompted the brief. This will affect teaching, for example, in how to re-evaluate an initial design intent as presented by an industrial partner, and how to research the philosophical approach of an organisation, their existing and potential markets, their production capabilities and even their potential, such as through specific underutilised employee skills.

Figure 2. 'Real world' project example 2: Reception desk (Ancher 2010)

Whilst there are examples of excellent 'real world' projects (e.g. Fisher and Paykel Healthcare project [13]), there is a constant shortage of quality learning projects and lecturers frequently begin a potentially good project with a client only to find problems arise. The project in Figure 2 was set up with the intention of providing a 'real world' linked learning activity that had a situational design starting point and was discussed with the client as an opportunity for innovation. However, the client had not worked with the university before and it became clear had expectations based on a constrained participation approach. The brief the client provided for the students was '*Design and fabricate a striking reception counter design. We are involved in shipping so it should reflect our core business and look 'boaty'.*' The derivative design basis for this project is typical of those university design departments are offered. The expectations of this client were limited and did not allow for the research and design development directions that a situational design brief is characterized by. From the student's point of view it was difficult to be creative within the constraints and expectations of this client and they expressed anxiety over trying to second guess the client rather than engage with the project properly. From the lecturer's point of view the access to participatory activity research was difficult to manage and fundamental shared ideas on evaluating good student design work were simply not there. Ultimately the lecturer felt the client was looking for cut-price design and he was forced to meet the client brief himself in his own time to allow the students to fulfil the learning objectives of the course and still maintain the reputation of the department – an additional stress for the lecturer. Working with client partners on a project that has a situational base and is aiming to provide students with a qualitative change in perception based on the teaching and learning drivers identified by Race et al [14], requires collaboration at a planning level to include an understanding of course learning objectives, assessment criteria that is not solely outcome driven and a shared value system for the process of the project. Ultimately, the success of a project intended to provide a deep learning experience for the student, depends on the ongoing collaborative relationship of the industrial or business partner and the academics.

4   CONCLUSION

'Real world' projects provide opportunities for 'significant' learning that are potentially very valuable for student development. However, it is essential that all stakeholders know what teaching and learning is going to happen to avoid confusion and a conflict of interests. Stevens et al stated 'We also

know that students need to be challenged to think critically, and we know what kind of assignments will lead to critical thinking in our respective disciplines.' [15] The main differences in the student learning experiences for the two approaches are the levels of autonomy for the students. 'Significant' learning is not as easy to manage and has less predictable results. Understanding this and the underlying teaching and learning drivers, including the learning objectives that allow for learning by doing and reflection on mistakes as a development tool are fundamental to the successful collaboration of industrial partners and academia, and yet are currently often not overtly expressed prior to beginning a 'real world' project. Creating designers who are pro-active, life long learners who can identify their own learning needs and direct their own learning is a positive outcome for the profession. Helping lecturers to create and manage significant learning experiences in relation to the changing professional practice is a challenge for industry partners in creating positive learning activities. It may be that to benefit long term, the industry will need to invest the time and energy into supporting the complexities of situational based design projects that have a basis in 'real world' partnerships but are valued for process over product as a learning activity. This is more time consuming, more difficult and cannot be expected to produce a short-term pay-off, but has the long-term pay-off of graduates who are innovative, confident and can manage their own projects more effectively.

4.1 Recommendations

- Evaluate proposed projects for learning experiences within current learning and teaching theory prior to formalising any collaboration between academia and industry.
- Clarify the teaching and learning objectives for proposed 'real world' projects to ensure that all stakeholders, including students but particularly the clients, are aware of these objectives and truly understand the implications for the project.
- Limit constrained participatory projects to the realistic outcomes of the project and ensure that assessment reflects the development of transferable skills and the management of a design project only and does not contain expectations beyond these.
- Only work on situational design projects with collaborative partners who are very clear on the long term learning objectives fostered by this approach.
- Price the students' and the lecturers' time so that it is valued as much as the time put in by the business by all stakeholders.
- Make clear the modularity of university courses and the inflexibility of university deadlines as well as those of business partners.

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