

Sustainable product design: Learning through live projects

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Introduction

Live projects with industry partners are common practice on undergraduate design courses. Hurn (2013) argues that live projects are a vital element of product design study, whilst Bartholomew and Rutherford (2013) propose that they are an integral part of design students' learning.

The BA(Hons) Sustainable Product Design course, at Falmouth University, has a long history of negotiating live projects to enhance student learning. Recent project partners have included Hille Educational Products and the Eden Project.

This paper draws on two case studies of live projects conducted by second year students on the course, and seeks to identify the learning opportunities generated. Both projects demonstrate the importance of collaboration and networks in developing design practice that contributes to eco-social sustainability. The learning opportunities for the project partner and academics involved are also investigated.

By comparing live projects with a private company and a charity, the paper also explores the different learning opportunities and engagement with communities that these two approaches provoke.

Case study 1 – Lowe Alpine

Lowe Alpine (LA) design and manufacture outdoor equipment, clothing and backpacks. Based in Kendal, Cumbria, they are well positioned in terms of their market and access to an excellent testing ground for their products. As a company whose product range encourages active participation with the outdoors, it is perhaps expected that they would be good advocates for sustainable design thinking and environmental stewardship. Their website states, 'The environment that we climb, run, hike and bike in is important to us and we understand the impact we have on it.' (Lowe Alpine, 2016).

The Sustainable Product Design students investigated opportunities for backpack products in new or emerging markets. They developed design proposals responding to identified user needs, whilst embracing environmental and socially responsible approaches. LA were keen to investigate their reach to people either much younger or much older than their typical backpack customer. The design brief was developed to reflect this, in partnership between the author and LA, whilst responding to the module learning outcomes.

The company were particularly interested in one concept developed, the 'Zero' short break travel bag (see Fig. 1). The student observed holidaymakers in her local town to establish behavioural patterns and discovered a market opportunity for a 'day pack' for women, over fifty years old. The concept adopted an inclusive design approach, making it accessible and appealing to the largest possible number of people (Eikhaug et al 2010). The bag was designed to be lightweight with an intuitive opening and closing method negating the need for fiddly clips or a zip closure.



Fig. 1: Holub, 2014. 'Zero' short break travel bag.

The notion of dematerialisation (Shedroff, 2009) was also extended to the fabric used to make the bag. The component parts are efficiently 'nested' on a standard fabric length so that every portion of the material is used in production and there is no waste from off cuts.

The value of inclusive design was explored and discussed with research participants and LA staff. LA designers recognised, for example, the parallels between designing a usable fastening system for people on a mountain with very cold hands, and people who suffer from rheumatoid arthritis.

The relationship with the manufacturer also fostered techno-centric approaches to sustainable design, where students benefitted from the materials and production information provided. This led to many students investigating alternative materials, with lower environmental impacts, and considering system solutions such as product repair, product take-back and cradle-to-cradle (McDonough and Braungart, 2002) approaches.

LA benefitted from a range of design concepts that explored new market areas and business models, but were also able to consider sustainable design strategies adopted by the students. LA designer, James Hadley expressed that, 'the students provided new insights into users and research areas' (Hadley 2016). The student who designed the Zero bag was offered an internship with the company and contributed to the work of the design team.

Further to advancing networking and project negotiation skills, the author was able to develop research and design methodology workshops which were tailored to the project.

Case study 2 – Cornwall Mobility

Cornwall Mobility (CM) are a charity based in Truro who provide advice and support for people with physical disabilities and mobility difficulties. They work with adults and children to evaluate their specific needs and offer a large range of assistive technology and mobility products to support independent living. In particular, activities such as washing, cooking, dressing, undressing, and getting around the home, are key areas where support is provided (Cornwall Mobility, 2015).

The charity has a very large network of clients with wide ranging age and ability. They are, 'acutely aware of areas in which design improvements can be made, particularly if they are niche or orphan products which will never produce a significant return upon investment, but may be of immense help to a small number of individuals in retaining their independence' (Trehwella 2016). The combination of a large potential user group and insight into the assistive technology industry, provides an excellent research platform to drive new product development. The charity is well connected to manufacturers and suppliers and would have the potential to license design ideas to them.

The Sustainable Product Design students developed concepts that responded to the needs of users with physical disabilities and mobility difficulties, in relation to daily, domestic tasks and activities. The project began with a visit to the charity headquarters where students could experience a range of products and equipment first-hand, and discuss design opportunities with CM staff.

Human-centred design (HCD) research tools, including the IDEO Method Cards (IDEO, 2010), were used to develop design concepts. For example, 'rapid ethnography' (IDEO, 2010) was conducted in a local care home to identify opportunities for more inclusive furniture and equipment. It was observed that residents who relied on a walking frame, or 'rollator', for mobility naturally placed the frame in front of them when they sat down. The rollator then became obstructive by blocking line of sight, impeding communication and interaction with other residents and care home staff. It was also observed that some residents had customised their rollator frames to carry a bag on the front to store small personal items. This insight led to the development of seating and table concepts where the rollator took on the appearance and function of a side table, and the seating accommodated access from the front or the side (see Fig. 2).

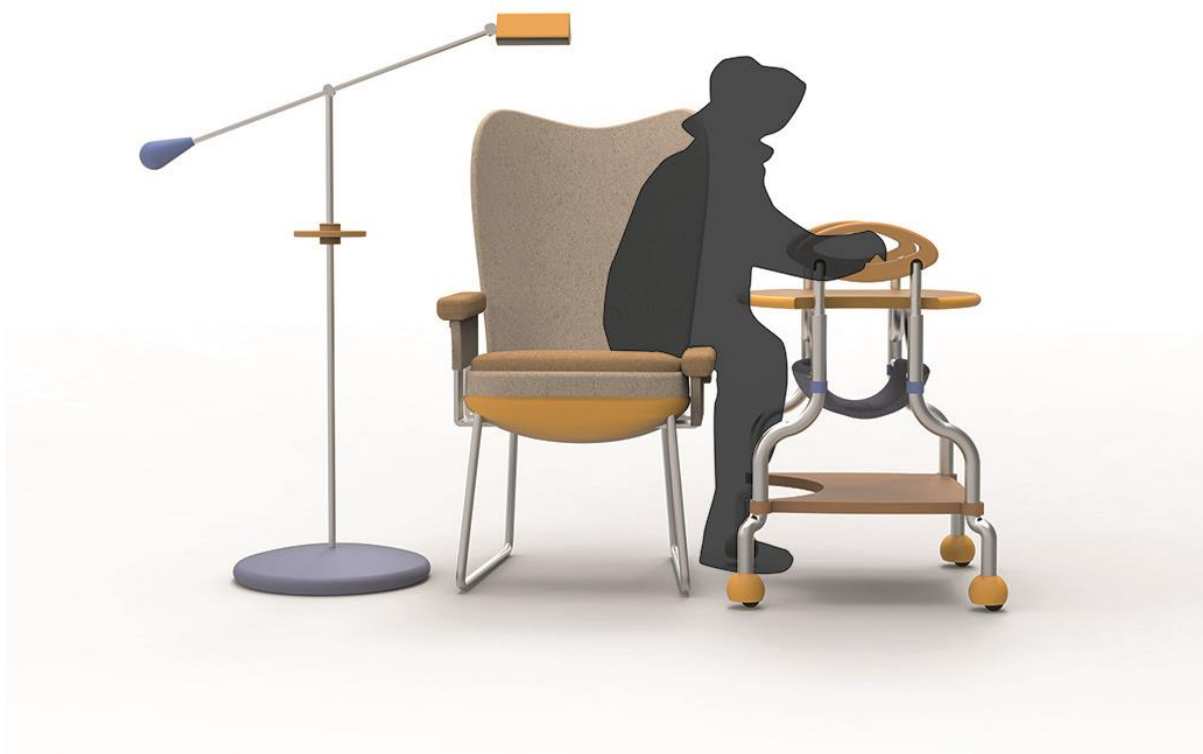


Fig. 2: Oaten et al 2015. Care home furniture concepts.

The variety of design opportunities and wide client network placed a greater focus on strategic HCD research activity compared with the LA project. Many students approached groups and organisations within CM's network to establish and evaluate design opportunities. The projects allowed for more practical experience for students to consider research ethics and develop appropriate participant information and consent forms.

CM benefited from reviewing a range of design concepts that explored underdeveloped areas, but were also able to see the advantages of sustainable design strategies as well as appropriate consideration to usability. CM's Chief Executive, Edward Trehella also commented that, 'improvement in aesthetic design - something the industry constantly struggles with - as part of an inclusive design approach has been a refreshing part of the experience of working with the students' (Trehella 2016).

The students' work was exhibited at the university at the end of the project, and later at the Eden Project. Staff and residents from the care home were among visitors that came to the private view. The event provided an opportunity for participants involved in the design research to see the project outcomes and discuss the students' ideas. It was also an excellent networking opportunity for CM staff who attended the event.

Finally, the project has provided an excellent learning opportunity for the author in relation to assistive technologies, supporting an on-going collaborative research and development project with CM to design a beach wheelchair.

Learning Opportunities

A review of the live projects allows us to broadly distinguish where the key learning opportunities exist for the students, project partner and academics (see Fig. 3).

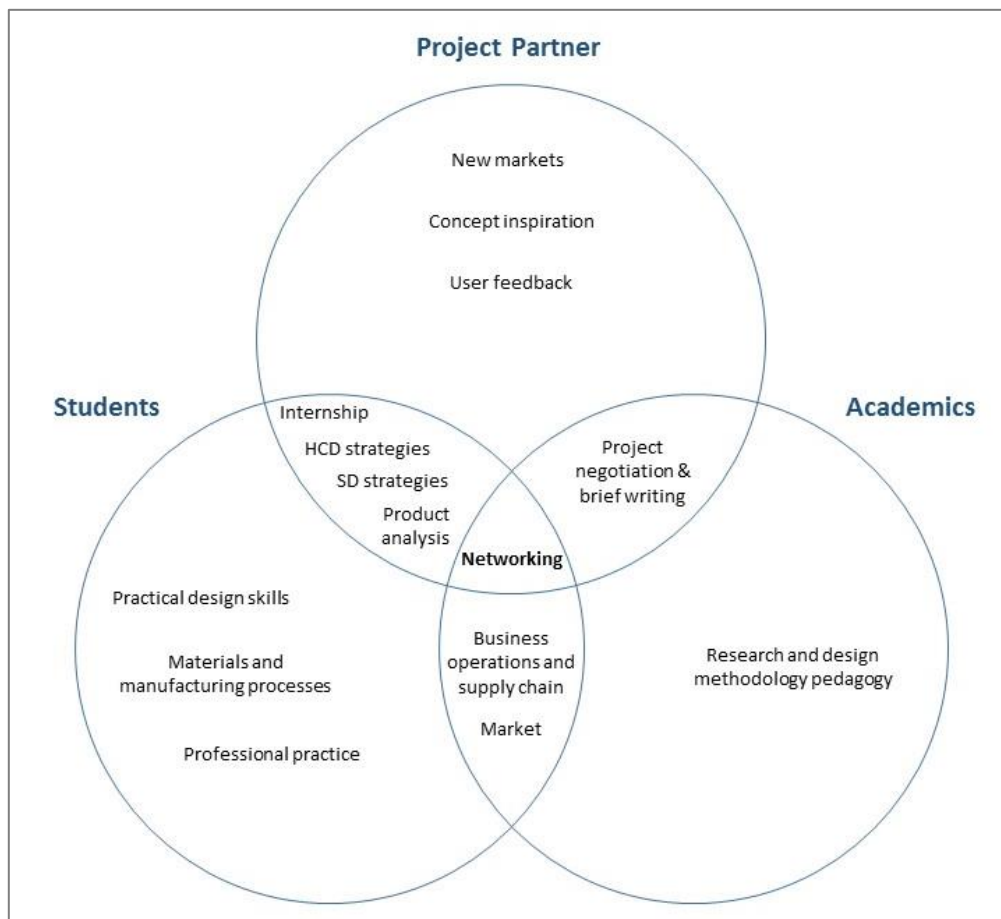


Fig. 3: Andrews 2016. Live project learning opportunities.

It is not intended that the diagram represents a definitive model and other learning opportunities may be identified from working with different project partners. The emphasis placed on the learning opportunities may also vary between projects as has been found by comparing the two case studies. However, the model does place 'networking' as a central component and shared learning opportunity.

Conclusions

Both projects offered the students a 'real world' perspective on a design brief, developing their professional practice with project partners and engaging with communities through HCD research activity.

Project partners have benefitted from exposure to market insights, design concepts and methodologies practiced by the students. Live projects have allowed academics to develop skills in project negotiation and brief writing, and build research and teaching practice relevant to the contexts of each project.

Working with a manufacturer focused the student learning towards developing an eco-social responsible product, considering market and industry constraints. The relationship with the charity, however, placed greater emphasis on HCD research techniques, with a wider network of participants, to establish user needs.

Central to both live projects was the opportunity to learn through networking and expand communities of sustainable design practice.

List of figures

Figure 1: Holub, S. (2014) 'Zero' short break travel bag. From: Falmouth University 3D203 module, student presentation 9th May 2014.

Figure 2: Oaten, T., Bergiers, A. and Williams, M. (2015) Care home furniture concepts. From: Falmouth University SPD205 module, student design report 12th May 2015.

Figure 3: Andrews, S. (2016) Live project learning opportunities. Diagram by the author.

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