PROJECTS FOR MULTI-DISCIPLINARY TEAMS: ENGAGING STUDENTS ACROSS DESIGN DISCIPLINES IN A SHARED UNDERGRADUATE FIRST YEAR CURRICULUM

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Abstract

On undergraduate design courses at Edinburgh Napier University, two thirds of the first year curriculum is shared. Working in open studios, students are able to gain awareness of each others' modes of practice and the common skills that transcend disciplines. This paper explores introductory generic projects for engaging students across three areas (Graphic Design; Product Design; and Interior Architecture), and enabling the concurrent development of both specific and shared skills while also gaining experience of working collaboratively.

The paper will reflect specifically upon a project where students worked in multi-disciplinary teams to design a toilet compartment for a high speed train. Students were required to employ full-scale modelling and prototyping in exploring the user trip and human interaction within the space; the organisation and planning of the space; the usability of the objects within; and the signage and semantics. In doing so, students were able to solicit user centred feedback on ergonomics, communication and usability and implement changes where necessary.

The paper will expand on the cross-disciplinary learning and teaching experience and reflect upon the design outcomes. It will also report on subsequent collaborative cross-disciplinary engagement for both students and tutors and the blurring of boundaries between courses.

1. Introduction

Designers usually work with cross-disciplinary teams: for example, the product designer with the entrepreneur, the graphic designer with the printer. But today, the product designer is also the entrepreneur; graphic designers don't print so much, they publish on-line. That is to say, designers are also cross-disciplinary multi-taskers.

Design is increasingly a multi-disciplinary profession: the consultancies with "house" specialities have changed. Take a look at the website of Foster + Partners[1] and you will find that this leading architectural firm also do product design and workplace consultancy. Seymour-Powell[2], once specialists in product and automotive design now undertake work in, among other things, brand strategy and animation. IDEO[3], who worked with Apple in their early years undertake a wide range of design projects including urban design and business consultancy. Yet, in the UK undergraduate design students are still generally educated by discipline.

The notion of a foundation art and design education, where students explore a range of disciplines before embarking on one specialism emerged at the Bauhaus almost a century ago. In the UK today, many students continue to take an Art Foundation course before choosing a three year undergraduate design subject at University or Art School. In Scotland, where undergraduate honours degrees are fours years in duration, the first year is usually taught as a type of foundation course, even though students have already chosen their specialism, which is the case at Edinburgh Napier.

As designers increasingly work across disciplines and utilise the expertise of technologists, psychologists and entrepreneurs, a challenge for design departments in many universities and art colleges is to break down disciplinary silos. Specialist programmes are often in danger of working in clearly marked territories with notional "keep out" signs for fear of diluting or even "contaminating" the students' curriculum and specialist base.

At Edinburgh Napier University, three of the Bachelor of Design (BDes) degrees – Graphic Design, Product Design, and Interior Architecture - share several studio modules in the first year. Design projects are used that enable students to develop common skills: visual research, sketching, problem solving, communication, team work. The challenge is often to convince students of the relevance to their discipline of studying another: for example, to the Interior Architect, time spent learning about product design, could be time spent improving their spatial design skills.

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[1] www.fosterandpartners.com
[2] www.seymourpowell.com
[3] www.ideo.com

This is naïve, but the students are relatively new to the subject and have yet to understand design in a wider context. Projects were needed that not only allowed students to build relevant skills within their chosen discipline, but enabled them to work with other types of designer.

A design objective had to be created that was exciting and yet deeply relevant to the students on all of our undergraduate design programmes while developing skills that would under-pin students' development whatever programme they progressed into.

2. The Project

A project to design a toilet cubicle for an inter-city train (see below) met much of the criteria that had been set. The project is broad enough to contain design elements of appeal to spatial, form and image minded design students (i.e. interiors, product and graphics), while at the same time using 1:1 scale visualisation and modelling as a design development tool. A full-scale sketch model allows for the enactment of user-trips, and can reveal flaws in a design that would be difficult to notice in drawings, small-scale models, or virtual models. Questions relating the height of fittings, the location of signage and mobility within the space, can be answered quickly with a full size prototype.

2.1 The Brief

BDES (HONS) GRAPHIC DESIGN
BDES (HONS) INTERIOR ARCHITECTURE
BDES (HONS) PRODUCT DESIGN

Module:	Basic Design 1
Tutor(s):	Richard Firth; Lisa Morgan
Duration:	3 Weeks

Train Toilet

This project introduces you to ergonomics, the organisation of space, and the interaction with objects within the space.

INTRODUCTION:
Designers need to be able to juggle and manage a range of different problems and issues within each project. Each decision and choice has an impact on the other. Compromises need to be made to achieve a successful end result.

Working in Teams
The skill of design is easy compared with the skill of working with other people. This project requires you to work in teams to develop and realise your design outcome.

Design and design projects involve team work which includes working with other professionals, subcontractors, the client, and the public. Involving other people into any process can introduce egos, different personality types, differing work ethics, social and financial backgrounds, genders and disabilities.

Learning Aims

- Interpret information
- ergonomics
- exploration of ideas
- concept development
- full scale model making
- develop team-working skills
- Present solutions.

Brief

Design and develop a toilet unit for a train*. Plan and elevations for the space are attached.

You will be working at 1:1 scale. Before you start developing your designs each team must build a full size area of the toilet unit using 3mm packing card. You will use this unit as your test bed and stage for your final presentation.

Organising the teams:

Each team will be made up of five team members, allocated by tutors. You will need to:

- Organise delegate responsibilities with in the team
- Gather information (photograph measure train loos)
- Gather information on ergonomics
- Brain storms the culture and process of washing etc on the move.

Design Spec: *Your design must include the following.*

- *1 WC*
- *wash basin*
- *toilet roll dispenser*
- *hand towel-dryer-paper towels (you decide, is there another solution?)*
- *waist bin*
- *mirror*
- *hand rails*
- *emergency assistance call device*
- *lighting*
- *baby changing shelf*
- *door you security*
- *any other devices you decide upon through user centred research.*

*note: most trains have a special toilet for wheelchair users – the space allocated is based on a standard toilet and does not allow for this. However, you must consider the widest possible range of users

Remember you are designing the space, the organisation of the features in the space, the fixtures and fittings and the signage: How do you interact with the products in the space? Do you have taps; foot pumps sensors under the taps?

Assessment Requirements:

- All sketch books
- All development work
- Plans and elevations
- Visuals of final solution with notes to describe the design
- One full scale model
- A team diary. Documenting your design journey

2.2 Group Working

An essential skill for designers is working with others. If students are to work across design disciplines and beyond disciplinary boundaries, it is vital that they develop team working skills, and do so throughout their entire degree.

Figure 1: Students teamworking (R. Firth 2006)

In a previously published paper[4] we discussed how in British higher education, group work is used in design as a means of fostering innovative teams, or what Tom Kelley of IDEO refers to as "hot groups" (Kelley, 2002, p.69). It takes time and patience to instil a team working ethic in students. Kelley talks of designers in teams "pouring all of their ideas on to the table" (Kelley, 2002, p. 24), for the good of all. First year design students can be very precious and protective in their attitude towards their own ideas. But it was essential for students to recognise the value of working with other designers.

The students quickly realised that as a team they could achieve a lot more than the sum of individual effort (see fig 1). They were asked to build a first phase 1:1 scale prototype, which was then subjected to user feedback. Other teams and students from other year groups were invited to analyse the spaces leaving feedback on post-it notes (fig.2). Feedback referred to many points including accessibility: *"the sink is too high for children"*; inclusivity: *"those with limited mobility may struggle to stand up from in a seated position"*; semantics: *"the sink looks like a urinal."*

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[4] Lost In Translation: Teaching Product Design Across Cultural and Language Boundaries in China and the United Kingdom, *Ian Lambert and Richard Firth. Cumulus 2009*

Figure 2: First phase prototype with user-feedback left on post-it notes (I. Lambert 2006)

2.3 Prototyping Development

The teams discussed the feedback and made improvements to their designs, sometimes with considerable adjustment, thus learning the value of prototyping and testing in the development process. Told to not be "precious" with their models, students were encouraged thus: "your models should bear the scars of your thinking." (See fig.3). They were able to refine the form, function and detailing of their designs with a degree of detachment to the effort which had gone before.

Figure 3: Second phase prototype showing the "Scars of thinking" (R. Firth 2006)

Going through the process a second time allowed for reflection and for the students to quite literally learn from their mistakes. They were learning the importance of discussion, listening to others, and trusting in the ideas of others. Some students emerged as obvious leaders, others as followers, but all were learning.

Also of interest to us, and a sign of success, was that the elements in each design were not necessarily undertaken by students according to their discipline. Where many students had been sceptical of the value of undertaking design briefs out-with their disciplines, graphic design and interior architecture students were keen to be involved with the development of form for fixtures and fittings; product and interiors students were keen to work with signage and product and graphics students on the space management. Graphic design students were also keen to explore the semantic qualities of forms and fixtures as a means of visual communication, and intuitive way-finding around the features of the space.

3. Conclusion

This project ran from 2005 to 2008. How students have taken these skills forward into projects as they progress into their specialist areas is yet to be measured accurately – many students certainly use full-scale/live prototyping within their chosen programmes, but breaking down of disciplinary silos is a challenge not just among students: it is even more so among established tutors.

We are now aiming to revise this project and run it in year 3 of the undergraduate programmes. For our first year students the studio atmosphere created by the hands-on collaboration between students and interaction with staff made for a very effective learning environment, but it was also resource intensive in terms of space and staff supervision. (See fig. 4)

Figure 4: Full-scale prototypes in one studio take up much space (I. Lambert 2006)

It also seems that the project has done little to strengthen ties between students once they embark on their specialist discipline, with much of the cross-disciplinary experience quickly forgotten. The project will be re-launched to run at a time when students can bring a more advanced range of skills to a cross-disciplinary team, but also when they can more easily recognise that their skills are transferable.

Product design as a discipline has become more expansive as a discipline over the last twenty years as much of the world's mass manufacturing base has headed east – the title of product designer still exists but practitioners in this field are increasingly working in service design, interaction design and creative entrepreneurship. With the construction industry hit by the recession, architects are now transferring their skills into other fields of design – the UK's Royal Society of Arts (RSA) most recent student design competition included a brief entitled, *The Resourceful Architect: What Else Do Architects Do?* [5]

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[5] http://www.rsadesigndirections.org/projects/projects4.html

It is clear that in order to stay competitive, designers and architects need to be agile and flexible in the market place, and ready and willing to form partnerships in other areas of expertise – that is to say, blur the boundaries.

Renaissance polymath Leonardo Da Vinci is perhaps the original product designer. Among other things, Leonardo was an artist, scientist, engineer, anatomist and inventor. Today's designer needs to be able to visualise (artist), use technology (scientist), specify materials (engineer), apply human factors (anatomist) and innovate (inventor). They also need to be entrepreneurs, economists, sociologists, ethnographers and cultural ambassadors.

But it is a mistake to try to define a designer as an individual. Today's designer-polymath is a team, working across boundaries and which are slowly blurring as a result. To fulfil a rounded design education our students need to collaborate among themselves and with technologists, engineers, entrepreneurs and a range of other experts, and just be a Designer.

References

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