

Multi-disciplinary design education in the UK

Eight case studies

NOVEMBER 2010



PROMOTING
GOOD
DESIGN
PRACTICE

‘We need business people who understand creativity, who know when and how to use the specialist, and who can manage innovation; creative specialists who understand the environment in which their talents will be used and who can talk the same language as their clients and business colleagues; and engineers and technologists who understand the design process and can talk the language of business.’¹

Sir George Cox,
The Cox Review of Creativity in Business

Introduction

Sir George Cox's 2005 *Review of Creativity in Business* put creative capabilities at the heart of the UK's ability to compete with emerging economies in a global market. Universities, said Cox, had a clear role to play in 'equipping tomorrow's business leaders, technologists, engineers and creative specialists' with the skills needed for such a market.

His specific recommendation around this issue was to propose the creation of 'centres of excellence [...] that specialise in multi-disciplinary programmes encompassing both postgraduate teaching and research.' The focus would be on Masters level programmes which would 'bring together the different elements of creativity, technology and business', enabling students from different backgrounds and with varying levels of industrial experience to work together. The outcome, said Cox, would be:

'executives who better understand how to exploit creativity and manage innovation, creative specialists better able to apply their skills (and manage creative businesses) and more engineers and scientists destined for the boardroom.'²

A number of universities across the UK heeded this call to arms, and over the last five years they have been developing courses and research projects where design works alongside and in collaboration with other disciplines. In some cases this led to the formation of new teaching and research centres, while in others the focus has been on creating new postgraduate courses or embedding design within existing ones. In this report we look at eight of them, each of which has taken a slightly different approach to multi-disciplinary design education.

¹ Cox, G. (2005) *The Cox Review of Creativity in Business: building on the UK's strengths*.

² Ibid.

Multi-disciplinarity as a response to a changing world

Cox was by no means the first to propose that changes would need to happen *within* university structures if universities were going to be able to respond to the social and economic changes going on *outside* them. Although the waves of student unrest in the US in the late 1960s are mainly associated with anti-Vietnam protests, there were also calls for disciplinary structures to be removed and replaced by more holistic concepts closer to practical life.³ The OECD's flagship work *Inter-disciplinarity: Problems of Teaching and Research in Universities* noted in 1972 that while inter-disciplinarity can be said to arise from five demands, its 'original social demand' was the emergence of 'particular needs and new subjects', which could not be contained within a single disciplinary frame' – or, as a later OECD report remarked pithily, 'Communities have problems. Universities have departments'.⁴

Definitions of multi-disciplinarity

Despite more than 40 years of cross-disciplinary practice in universities there is still a lack of precision about what the terms 'inter-disciplinarity', 'multi-disciplinarity' and 'trans-disciplinarity' actually mean.⁵

One distinction proposes that 'multi-disciplinarity' describes situations in which several disciplines cooperate but remain unchanged, whereas in 'inter-disciplinarity' there is an attempt to integrate or synthesise perspectives from several disciplines. Trans-disciplinarity, on the other hand, has been taken to involve a transgression or transcendence of disciplinary norms, 'whether in the pursuit of a fusion of disciplines, an approach oriented to complexity or real-world problem-solving, or one aimed at overcoming the distance between specialised and lay knowledges or between research and policy'.⁶

For the purposes of this study, which looks at courses and initiatives which teach design and creative problem solving alongside business and management education and/or technical and science subjects, the term 'multi-disciplinarity' is used unless academics or institutions specifically describe their work using another term. Further research into the extent to which these courses and centres go beyond collaboration and into transformation could well be a fruitful addition to the literature on this subject.

3 Chettiparamb, A. *Interdisciplinarity: a literature review*, Higher Education Academy Report, 2007, p.12.

4 Thompson Klein J. (1991) *Interdisciplinarity: History, Theory, & Practice*, p.41; Chettiparamb, A. (2007) p.9.

5 McEwen, L., Jennings, R., Duck, R. and Roberts, H. *Students' experiences of interdisciplinary learning*, Higher Education Academy Report, 2008, p.15.

6 Lawrence, R., Despres, C. R. *Introduction: Futures of transdisciplinarity*, Futures, 36 (4), 2004, p.398 in: Barry, A., Born, G. and Weszkalnys, G. *Logics of inter-disciplinarity*, Economy and Society, 37, 2008, p.27.

Eight case studies

The remainder of this report looks in more detail at eight institutions where multi-disciplinary design teaching has developed since the recommendations of the *Cox Review*.

These case studies show that multi-disciplinary design teaching and research in universities can take a number of forms:

- Design London builds on a heritage of cross-institutional collaboration to provide design-led modules for MBA students, designers and engineers, with a focus on business incubation
- C4D shows how a course can run in tandem across two institutions, and how multi-disciplinary workshops can develop research and teaching
- Nottingham University Business School is embedding design thinking in entrepreneurship education
- Northumbria University is developing multi-disciplinary curriculum and assessment design
- Kingston University is researching multi-disciplinary teamwork
- Nottingham Trent University is using multi-disciplinary teams of staff and students to work on live projects for companies
- Lancaster University is embedding multi-disciplinary design research within a contemporary arts institute
- University College Falmouth is prototyping multi-disciplinary team projects prior to opening a new research and development centre.

A conclusion follows, which highlights some common challenges identified during interviews with academics.

These case studies have been put together through interviews with senior contacts at the eight universities selected to take part. The universities were chosen to illustrate the wide range of activities underway across the UK. This is not an exhaustive study of the UK initiatives and it is important to stress that many other activities of equal merit are taking place at other universities.





UK
Case
Studies

Design London



BUILDING ON A HISTORY OF CO-OPERATION BETWEEN INSTITUTIONS

Design London is a collaboration between Imperial College Business School, Imperial College Faculty of Engineering and the Royal College of Art. It was created in 2007 with £5.8million funding for three years (£3.8 million from HEFCE, £900,000 funding from NESTA for an incubation centre and the remainder from within the Royal College of Art and Imperial College), its HEFCE funding has now been extended until 2011. Design London offers teaching, research, a business incubation unit, an Innovation Technology Centre and a programme of industry services and executive education called 'Design Connection'.



Multi-disciplinary teaching and learning

Design London's existence draws on long heritage of multi-disciplinary collaboration in South Kensington, where both the Royal College of Art and Imperial College are based. They had been 'nosily looking at each other's washing' since the the 1960s, and as far back as 1973 there were attempts to create a joint Masters degree in design engineering.

‘There was a growing recognition that design and engineering were on converging paths. RCA Professor Frank Height was concerned about the diminished value of engineering, and keen to promote design for need (in the spirit of Victor Papanek), and the synthesis of prototypes in design. He wanted to create a “new cadre of designers” who created designs that were manufacturable and holistic, and products of independent thinking, and he saw a joint course with Imperial as the way forward.’⁷

The Industrial Design Engineering two year Masters course began in 1980 with a cohort of four students. Thirty years later its focus has shifted from the pure ‘design for industry’ vision to a more holistic ‘design for society’ approach, and its acknowledgement of a wider shift from product design to product service systems is detectable in the change of the course’s name to Innovation Design Engineering. Alumni of the IDE course, who gain a double Masters (MA/MSc), can be found in companies across the world including Apple, Nokia and IDEO.

The connection between Imperial College London and the Royal College of Art was further cemented in 2005 with a formal collaboration between the two institutions, including funding for ‘Triangle Projects’ which aimed to unite scientific invention, commercial skills and user-centred design. One of the first to benefit was a project which saw a surgeon at Imperial College’s School of Medicine and Life Sciences work with industrial designers from the RCA to develop new tools for use in keyhole surgery, whose commercial viability was then assessed by MBA students from the Business School at Imperial.

Pro-Rector of the RCA, Professor Alan Cummings, describes the creation of Design London in 2007 as ‘this kind of collaboration extrapolated back into teaching’. Design London currently delivers teaching programmes to MBA, MEng, MSc, PhD and MA students in both institutions.

Central to this is the provision of design-led innovation modules on four MBA courses at Imperial Business School under the heading of Innovation, Entrepreneurship and Design (IED). By February 2010, Design London had taught its seventh cohort of MBA students, 366 in total. It also teaches a four-day MBA elective on Innovating and Designing Services.

As well as introducing MBA students to design thinking and design approaches, Design London selects MEng and postgraduate students from the Faculty of Engineering, Imperial College London and students, Research Associates and recent graduates from the Royal College of Art through its Fellowship scheme. More than 80 of these Design London Fellows have participated in the IED course, allowing them to enhance their entrepreneurial skills as well as learning how to transform creative ideas into new business ventures.

Following formal lectures, Design London Fellows work alongside MBA students undertaking an 18 week project that explores an emerging innovation in science, technology, design or business. These can either come from the students themselves – in the case of a materials scientist who needs design and business input to commercialise a technology, for example, or teams will work on an idea in development at Imperial Innovations, InnovationRCA or others in Design London's network. The project culminates in the presentation of a business case. Professor Alan Cummings comments that the students get 'terrifyingly good at presenting their work' – and selected projects then have the opportunity to enter Design London's Incubator via its Entrepreneurial Boot Camp and/or enter the Business School's business plan competition.

Since October 2009 Design London has also been teaching an option on Design-led Innovation and New Venture Creation to final year MEng students at Imperial's Faculty of Engineering, and a complementary course for third year engineering students is planned for October 2010. Similar short courses have also reached 160 Bioengineering MSc and PhD students.

Business incubation

The Design London Incubator, funded by NESTA, aims to bring together multi-disciplinary teams from business, design and technology backgrounds to turn ideas into viable businesses. Applicants need to have a connection to Imperial or the RCA (as staff, students or alumni) and the multi-disciplinary nature of the business idea is a key element of the selection criteria. The Incubator runs matchmaking sessions to help ensure ventures have the right mix of technologists, creatives and business people. After these sessions ten teams go on to complete a week-long 'Bootcamp' where they attend lectures and receive coaching to develop their business ideas. This culminates in a pitch presentation to a review board, after which three ventures are selected to go through to incubation.

Eight of the Incubator's ventures have already launched and attracted follow-on investment or are becoming self-sustaining. These include a revolutionary new method of folding sheet metal using robots, a waterless sanitation system that transforms human waste into power and a folding electric plug design that was named Brit Insurance Design of the Year 2010.

Incubator Matchmaking Event

Design London's Incubator runs matchmaking sessions to help ensure its ventures have the right mix of technologists, creatives and business people.





LooWatt

RCA graduate Virginia Gardiner worked with a team of five MBAs to develop the business for Loo Watt, a waterless toilet designed for the developing world. The system uses a simple hand-operated mechanism to package human waste in biodegradable packaging suitable for transportation to an anaerobic digester. There it can be exchanged for the digester's by-products, which are energy and fertilizer.



Folding Plug

Min-Kyu Choi's design for an electric plug, which can be folded flat, won the 2010 Brit Insurance Design of the Year award and was developed at Design London's Incubator.

‘Successful innovation demands a systemic not a component approach to designing new products and services. Edison didn’t just design and patent a light bulb – he created an entire new system that changed our world.’

—Nick Leon, Director, Design London

Research

Under the direction of Professor Bruce Tether, Design London has two Research Associates who, alongside staff, are conducting post-doctoral research into design-led innovation, the emergence of service design, and the design and innovation of service systems, and analysing the development and competitiveness of the design consulting sector.

Tether is clear that for him and others engaged in multi-disciplinary design research, this area is not without its challenges. While multi-disciplinary research is often seen as ‘a good thing’ by policy makers and research funders, university structures can make it hard to execute. This may be due to the constraints of producing research in individual schools and departments, each of which have different styles or understandings of research, and which favour publication in specific journals with a view to advancing individual researchers’ careers. He adds that, to a large extent, pursuing multi-disciplinary research requires identifying the individuals in various departments who are keen to take a less conventional path. The continuing assessment of multi-disciplinary research’s barriers and challenges as well as its rewards remains an important part of Design London’s work.

Innovation Technology Centre

Alongside teaching, research and incubation, Design London offers design visualisation tools to its students and business partners through its Innovation Technology (IvT) Centre, and a range of services for local businesses under the banner ‘Design Connection’. Projects include work for Bentley Motors, Honda, the Royal Society and the NHS. As Professor Alan Cummings explains, these executive education and business support services see Design London ‘bringing the same kind of [multi-disciplinary] mentality to SMEs – it enables us to look at the ways in which SMEs are operating and thinking, and lets us see how design, engineering and business is being integrated’. Researchers will also use the IvT Centre to observe the ways in which multi-disciplinary teams work and study the value and effectiveness of 3D stereoscopic displays, multi-dimensional modelling, digital prototyping and manufacturing technologies in the innovation process.

Industry services and public outreach

In 2008, Design London was appointed by the London Development Agency as the delivery partner for the Design Council's business growth programme, *Designing Demand*, itself another recommendation of the *Cox Review*. Working in partnership with Grant Thornton, it has delivered a range of executive education courses and business support programme to 350 participants from 250 of London's small and medium sized enterprises. In addition, Design London's STIR lecture series has seen speakers debate global business, social and cultural issues and has hosted more than 3,500 people.

Cummings, a graduate of Imperial himself, explains his own profession of art conservation as reliant on a combination of disciplines. 'As a conservator you have to be a scientist, you need to be an art historian and you also have to be a practising crafts person.' He describes seeing Design London come into fruition as 'immensely personally rewarding' for a long-standing advocate of multi-disciplinarity. He recalls 'nervously' bringing up the otherwise-ignored subject of design at a Smith Institute lecture on technology and the economy in the early 2000s by brandishing his iPod and explaining the concept of innovation in product service systems.

IvT Centre RCA

Design London's Innovation Technology Centre enables students and business partners to use the latest design and visualisation tools, including 3D stereoscopic displays, multi-dimensional modelling and digital prototyping and manufacturing.



C4D



DEVELOPING RELATIONSHIPS ACROSS INSTITUTIONS

A partnership between Cranfield University and the London College of Communication, University of Arts London, the Centre for Competitive Creative Design (C4D) was launched in 2007 using an investment of £3.5m over three years from HEFCE's Strategic Development Fund. C4D offers taught Masters courses and runs a research programme as well as services to industry.



Multi-disciplinary teaching and learning

Whereas Design London capitalises on the proximity of three institutions and on their history of collaboration, C4D shows how multi-disciplinary teaching and research can be offered by institutions which are geographically distant. The collaboration between Cranfield and London College of Communication provides another model for multi-disciplinary teaching: that of two institutions developing courses in tandem which run concurrently, and whose cohorts come together at specified points within the curriculum. The Masters course – MDes Innovation and Creativity in Industry – is now in its second year. At Cranfield, the current cohort of 14 students come from engineering or science-based industries and disciplines. The equivalent course at LCC has ten students whose backgrounds include product design, architecture, film-making and photography.

The two courses share a vision which brings them together at key points through collaborative multi-disciplinary design projects, lectures, visits and joint critiques. Alongside group project work, studio project work and self-initiated projects, podcasting and Second Life are used as teaching methods. Both courses include a group design project undertaken in a multi-disciplinary team and a major individual project submitted as a thesis, a practical exploration with a report, or public exhibition. Students also work on live industry-sponsored projects as part of their final degree. Recent projects have included a thesis on defining and characterising product experience for Ford.

The MDes programme is the backbone of the collaboration between Cranfield and London College of Communication, but academics and students from both universities have also worked together on a number of other projects and this shows the diversity of the relationship between the two institutions. Dr Alison Prendiville, Deputy Director of C4D and Course Leader for the MDes in Innovation and Creativity in Industry at the University of the Arts, London, describes the experience of working with scientists, engineers and medical technologists at Cranfield as ‘amazing’ and is enthusiastic about the activities of the past 18 months and the possibilities for future collaborative research projects.

Projects have included London College of Communication’s MDes Innovation and Creativity in Industry students working with engineers at Cranfield to map patient journeys for the development of new scanning technologies. Another, a one-day workshop held with Dr Rob Dorey, Head of Microsystems and Nanotechnology at Cranfield, culminated in a public exhibition at the Royal Academy of Engineering summer Soiree event at Cranfield University in June 2009 and the London Design Festival in September. Twelve students from LCC and London College of Fashion worked in multi-disciplinary teams to explore ways to visualise potential applications of nanotechnology, with Dorey using Basecamp online project management software to guide the students on the scientific appropriateness of their visualisations after the workshop. Ideas included energy harvesters which would create power systems from ambient vibration and sound generation by piezoelectric speakers.

Prendiville explains that such workshops can be used to explore and test design methodologies as well as for practical outcomes. Another project saw participants from C4D and the Information Environments research unit at London College of Communication work with scientists from Cranfield’s School of Health, designers, architects and stakeholders from local

‘Students from any field or skill can be exposed to other disciplines giving them the ability to apply “design thinking” in all aspects of industry.’

—Tania D’Souza, MDes Innovation and Creativity in Industry student

government and local health authorities to explore the role that new media and community spaces might play in well-being (for example, participants considered how gaming could link inside and outside spaces). Here, ‘well-being cards’ were piloted as a new design methodology tool to help participants to visualise and understand the complex nature of well-being and its processes within community spaces.

Research

Cranfield and London College of Communication are currently engaged in a number of research bids that, if successful, will see further collaboration between departments at the two institutions. C4D has also secured funding for substantial research projects, including ERDF funding of £815,510 for a multi-faceted approach which aims to stimulate SMEs to work in low carbon business innovation activities. C4D’s PhD programme currently has two students working on research areas that relate to emerging markets and design futures – one on empathic design and Chinese product design education, the other exploring the scope for Brazil to adopt and adapt design and innovation policy from the examples of the UK and China.

Services for industry

As well as setting live projects for student groups, organisations such as Procter & Gamble, the NHS, Ford and Nissan have run individual research projects with C4D. Procter & Gamble, for example, ran a project to facilitate the development of ideas for product development using consumer insight and rapid product modelling techniques, which informed their management’s high-level product planning sessions.

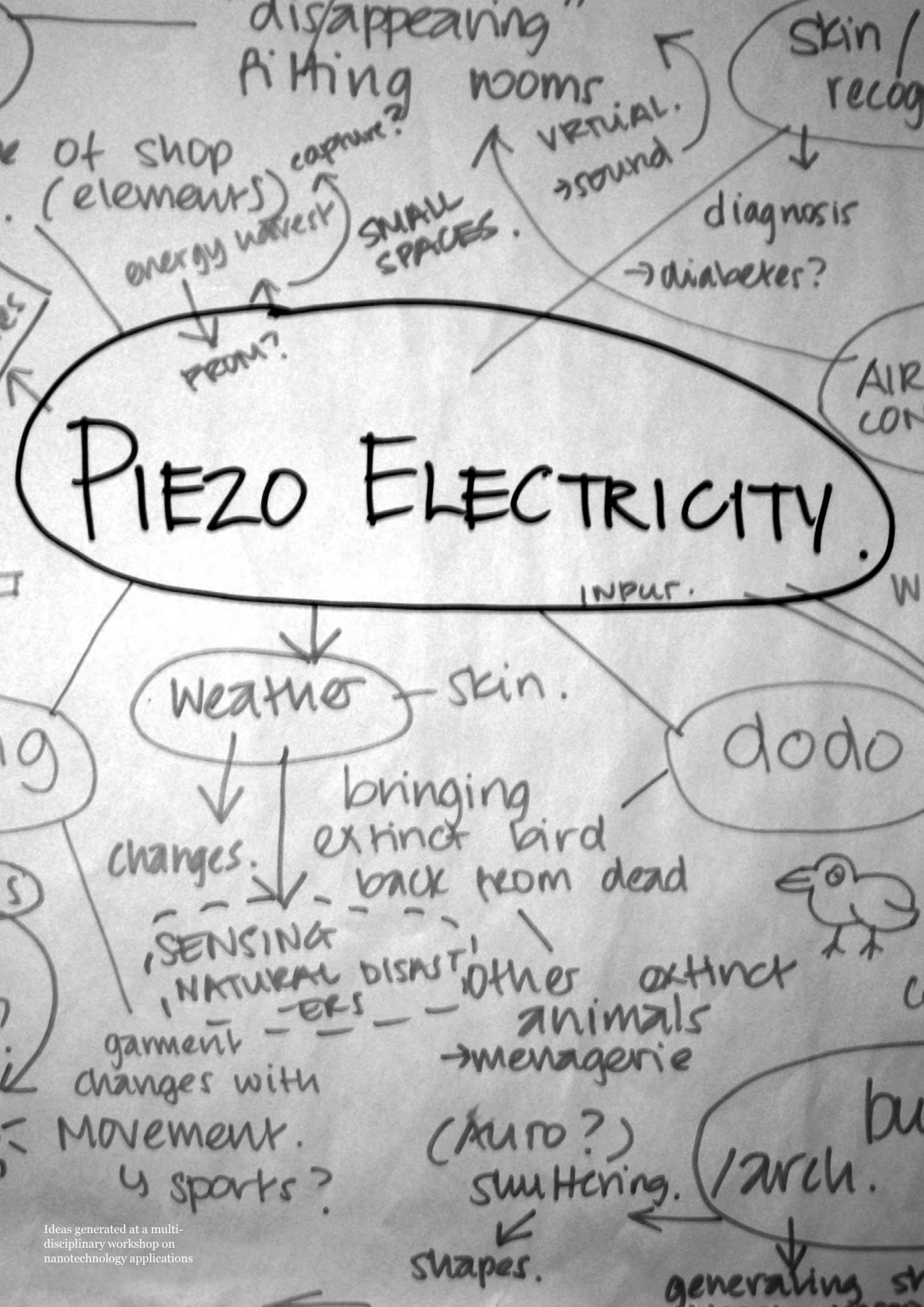
This is part of C4D’s range of services for industry, which include half-day Design Incubation sessions for external organisations or other academic departments who want to work with the centre. C4D has also run workshop trials of experimental innovation tools aimed at promoting and facilitating design thinking in public sector leadership. The tools, used in workshops with the Design Council and HM Treasury, were developed in multi-disciplinary collaboration with the Praxis Centre in Cranfield’s School of Management.

Perhaps the most important part of the C4D project is the willingness of so many of the staff from both institutions to acknowledge and reflect the unique cultures the two institutions, and to use these to consider how they are best placed to learn from each other. Dr Alison Prendiville maintains that this shouldn’t mean ‘obsessing about cultural difference’ – rather, the emphasis should be on finding commonalities of creative processes. ‘The value lies in creating communities’, she adds.



Students from London College of Communication and London College of Fashion in a one-day workshop on visualising potential applications of nanotechnology, held with Dr Rob Dorey, Head of Microsystems & Nanotechnology at Cranfield University.

PIEZO ELECTRICITY



University of Nottingham

EMBEDDING CREATIVE PROBLEM SOLVING AND
DESIGN THINKING IN ENTREPRENEURSHIP EDUCATION



The University of Nottingham Institute for Enterprise and Innovation (UNIEI) was established in 2000 and is based at Nottingham University Business School. It offers undergraduate and postgraduate teaching, research and practical support for staff and student enterprise as well as local business engagement under the banner of the EMDA-sponsored Ingenuity Programme.



Multi-disciplinary teaching and learning

The longest-standing example of multi-disciplinary teaching and learning in this study, the University of Nottingham Institute for Enterprise and Innovation, was cited in the *Cox Review* as an example of university and SME interaction. UNIEI offers a programme of one-year multi-disciplinary taught Masters courses, which link creativity, entrepreneurship and innovation with other disciplines and schools within the university.

The first of these courses was the MSc Entrepreneurship Science and Technology, which was set up in 1999 with five years of funding from the Office of Science and Technology. In 2005 UNIEI began working with the School of Chemistry to develop a course that would provide advanced technical skills in chemistry and develop advanced entrepreneurial creativity, the MSc Chemistry and Entrepreneurship. Since then UNIEI has gone on to develop Masters courses that link entrepreneurship with electronic and electrical engineering, molecular medical microbiology, food production management, crop biotechnology, sustainable energy, computer science, cultural studies, and communication.



Taught Masters courses at the University of Nottingham Institute for Enterprise and Innovation, based at Nottingham University Business School, link creativity, entrepreneurship and innovation with other disciplines and schools within the university.

Students spend half their time in their discipline's department and half with UNIEI, where they complete modules on creative problem solving, innovation management and marketing for entrepreneurship as well as finance, accounting and project management. UNIEI functions as a hub, bringing all students on the Entrepreneurship MScs together. Students spend time working in multi-disciplinary teams on live business projects and with mentors from the local business community.

UNIEI also works with undergraduate students. A semester-long Entrepreneurship and Business module based around the application of a three stage creative problem solving process was designed to encourage early stage or Pre-Concept Innovation. This module is taken by all 850 first year Nottingham Business School students in the UK as well as 700 in China and 300 in Malaysia. It can also be taken as an elective by second year Business School students and other students from schools across the university.

Design practices and design thinking approaches are being embedded within entrepreneurship modules studied by students from multi-disciplinary backgrounds.

‘Globally, it is recognised that creativity, innovation, risk, knowledge transfer and technology transfer are key to competitiveness.’

—University of Nottingham mission statement

Nottingham has pioneered entrepreneurship teaching and research (it was named the UK’s first Entrepreneurial University of the Year by the Times Higher in 2008) and it is in this area that elements of design practice and design thinking are being embedded, with the integration of design practices within entrepreneurship modules studied by students from multi-discipline backgrounds.⁸ Dr Andrew Greenman, Lecturer in Entrepreneurship and Creativity, is researching how these design practices – which include prototyping, brainstorming, problem mapping, crits and post-mortems and reflective practice – might have relevance for the development of entrepreneurship education, with particular reference to encouraging entrepreneurial imagination.

Research

There also four designers among the 18 PhD candidates at the Horizon Research Institute at Nottingham University (a £40million investment by Research Councils UK engaged in research into the digital economy and ubiquitous computing). At the multi-disciplinary Doctoral Training Centre the PhD researchers work in a four-year programme that combines taught elements, including Innovation and Technology Transfer, with industry engagement and practice-led research.

Student enterprise and business engagement

The use of mentors on undergraduate and postgraduate courses means UNIEI has developed a network of more than 60 local businesses and entrepreneurs. It also runs *Enterprise/ab*, which provides support for students, graduates and staff who want to develop business ideas through business surgeries covering finance, marketing, intellectual property, taxation, legislation and funding, and help with business planning.

UNIEI also delivers training in creative problem solving under the banner of the Ingenuity Programme, a three-year East Midlands Development Agency (EMDA) funded project, which connects small and medium-sized businesses in Nottinghamshire and Derbyshire to University of Nottingham, Nottingham Trent University and the University of Derby. Its ‘Ingenuity in Practice’ methodology is offered to decision makers at all levels from public sector bodies to SMEs.

⁸ Greenman, A. (2010) *Embedding design practices into learning activities to cultivate an entrepreneurial imagination*, British Academy of Management Conference, Sheffield.



At the University of Nottingham Institute of Enterprise and Innovation (UNIEI) students work on modules that include creative problem solving and innovation management.

Northumbria University



MULTI-DISCIPLINARY CURRICULUM AND ASSESSMENT DESIGN

Northumbria University offers a Masters in Multi-disciplinary Design Innovation, run by the School of Design in collaboration with Newcastle Business School and the School of Computing, Engineering and Information Sciences. Launched in September 2008, the degree can be awarded as an MA or an MSc depending on the focus of the final semester's work.



Multi-disciplinary teaching and learning

Before establishing the Masters course, Northumbria received a grant of £70,000 from HEFCE in 2007 to undertake a pilot study to assess the feasibility of multi-disciplinary approaches within the university, under the banner of the Northumbria University Design Innovation Lab (nuDIL).

During the pilot study, staff from the School of Design, the Business School and the School of Computing, Engineering and Information Sciences observed design, business and technology students undertaking multi-disciplinary, team-based projects set by industry partners, which included Philips, Hasbro, Lego and Unilever. Their aim was to identify the best ways to support individual and peer learning while encouraging innovation to flourish.



Students on the MA/MSc Multi-disciplinary Design Innovation working on mixed discipline projects for industry clients.

Insights included recognition that students needed confidence to express themselves and their disciplinary expertise, and particularly to question that of their team colleagues, and an awareness of the potential for misunderstandings to arise from different disciplines' different uses of terminology. Observation of teams also enabled staff to compare the students' tolerance for ambiguity – they found that while design students were comfortable with ambiguity and would only commit to a purpose when time pressure dictated it, business students were uncomfortable with ambiguity and preferred a systematic approach to innovation. Students with a technology background, meanwhile, were more comfortable with an ambiguous approach but needed to wrap this in an analytical process that grounded experimentation.⁹

The insights uncovered by this process enabled staff to plan and refine a programme structure for the MA/MSc Multi-disciplinary Design Innovation. The cohort of students work in mixed discipline groups in a neutral space, separate from the School of Design, Business School and the School of Computing, Engineering and Information Sciences. The interconnecting

⁹ Bailey, M. and Smith, N. (2010) *Working at the edges – liberating creative multi-disciplinary participation by curriculum and assessment design*, CLTAD Conference, Berlin.

‘Working in collaborative groups tests us on many levels. The experience of decision making, leadership, and idea/ego management within group activities is essential.’

—Edward Blazey, *Multi-disciplinary Design Innovation student*



The course is designed to bring together students from the School of Design, Newcastle Business School and the School of Computing, Engineering and Information Sciences.

rooms include studio and workshop style areas for brainstorming and prototyping as well as more formal lecture rooms. The space includes elements developed to enable students to share information in order to help them collaborate more easily, such as the ‘Wall of Words’, where students write phrases they hear which are new to them, so that members of the group from other disciplines can help to explain unfamiliar terms and concepts. To help develop students’ confidence, the programme includes a core module on ‘Understanding the Inter-disciplinary Self’, which spans two semesters and allows students to relate their project-based experiences to a theoretical framework in order to understand where they fit in and how they can contribute to the multi-disciplinary team.

Using the MA/MSc Multi-disciplinary Design Innovation as a working prototype, staff have also developed a different model of assessment to enable students to learn from failure as well a success. The first two semesters of the three semester course are pass/fail rather than graded; assessment is based not on project outcomes, but on the learning each student has derived from the various project and team activities undertaken through the module. This is presented in a ‘Personal Portfolio of Practice’ as both a factual account of what took place and a personal reflection of the consequent learning.

Because the proposed multi-disciplinary course did not bring together two different institutions it was not eligible for further grants from the HEFCE Strategic Development Fund after the initial pilot project funding. Instead, 18 studentships in the course’s first year were sponsored by North East Studentships (NESt), bursaries funded by ONE North East, the North East Regional Development Agency. Students undertake live projects with industry clients, and as well as working with SMEs from the North East region, they work with international blue-chip organisations, public sector bodies and charities. Recent projects have involved students developing products and services to briefs set by Unilever, the BBC, Barnados, the MS Society and the Traffic Penalty Tribunal at the Department of Transport.

Research

The NESt funding is also sponsoring a doctoral candidate at nuDIL who is researching invisible design and innovation practices within SMEs. In addition, the course development team continues to investigate and assess pedagogical approaches to teaching multi-disciplinary teams.



VELOCITY.

SPEED WITH DIRECTION

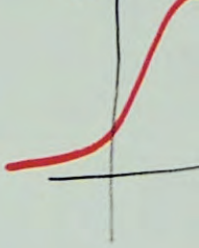
CRM

CUSTOMER
RELATIONSHIP
MANAGEMENT

'HERD' SHOT

A PHOTOGRAPH THAT ILLUSTRATES
A CONCEPT. A GOOD HERD SHOT MAKES
PEOPLE STOP AND STARE, AND WANT TO
KNOW MORE!

ROGER'S IN
ADAPTI



PORTE

BARGAINING
POWER OF
SUPPLIERS

**WHAT ARE THE
BARRIERS FOR AN
EFFECTIVE
MULTIDISCIPLINARY
TEAM?**

**DOES WORKING IN
MULTIDISCIPLINARY
TEAMS MAKE
COMPROMISE
INEVITABLE?**

**NATURE
Vs
NURTURE?**

**ARE THE
DIFFERENT
DISCIPLINES
WORKING TO
SOLVE THE
SAME
PROBLEM?**

**DOES THE
DEFINITION OF
LEADERSHIP
ACT...**

**DESIGN
THINKING**



Multi-disciplinary Masters students at Northumbria University work in a neutral space, which includes studio and workshop style areas for brainstorming and areas designed to enable students to share information in order to help them collaborate more easily.

**INNOVATION
FUNNEL**

- TRANSFORMATIONAL
- SUBSTANTIAL
- INCREMENTAL



SKY HOOKS
MAGICAL FASTENERS
SUITABLE

Kingston University



RESEARCHING MULTI-DISCIPLINARY TEAMS IN ACTION

In 2008, Kingston was awarded £250,000 from HEFCE for a two-year initiative to develop 'Innoversity', a cross-faculty project to investigate how multi-disciplinary teams from design, business and technology backgrounds collaborate to solve problems. Postgraduate students from Kingston University's multi-disciplinary 'creative economies' Masters courses are at the heart of the project, which is a longitudinal study on multi-disciplinary team-working and aims to transfer research knowledge into the teaching of Kingston's multi-disciplinary courses.



Multi-disciplinary teaching and learning

Kingston offers a suite of Masters in Creative Economy (MACE) courses. Launched in September 2007, these multi-disciplinary, one-year full-time (two-year part-time) courses cover five areas of study: Built Environment, Design Industries, Heritage and Visual Arts, Performing Arts, and Media. These courses are directed by the Faculty of Business and Law in partnership with the Faculty of Art, Design and Architecture.

A cohort of 40 students is currently enrolled on the MACE courses. Their backgrounds range widely, and alongside fashion designers with 20 years industry experience, there are copywriters, artists, music technicians, marketing managers and recruitment consultants. More than 80% of the students come from outside the UK. Alongside taught modules, which cover contemporary issues in the creative economy, leadership skills, techniques and tools, students begin the course by creating, designing and managing a viable creative enterprise project using their own funds as capital and working in mixed teams.



MACE students

Kingston's 20 Masters courses in Creative Industries & the Creative Economy see students from a range of backgrounds including designers, copywriters, artists and music technicians.

Researching multi-disciplinary teams

Kingston University has developed purpose-built spaces that encourage multi-disciplinary teamwork and networking, focusing especially on enhancing links between design and innovation. The Innoversity space within the Faculty of Art, Design and Architecture was specifically designed to aid the observation and video recording of multi-disciplinary teamwork, with cameras and sound recording equipment to capture the interaction between teams from design, business, and social science.

Kingston University's Innoversity space is designed to enable multi-disciplinary teams to work together.

‘Innovation, design and technology are all flowing into one another to form a single river of roaring change radically altering our culture, and especially our business culture.’

—Bruce Nussbaum, *Business Week*

It was originally envisaged that the problems the postgraduate students would tackle would come from within the University but eventually be generated by external companies. One early project saw a designer, marketer and a materials scientist work with nursing staff from St George’s Hospital to rapidly prototype a new heat and moisture-retaining plastic pouch for pre-term babies in maternity wards. Over the past year, it is the way in which the students on the MACE courses work together on their live creative enterprise projects, which has been the subject of study.

Along with the blogs that every student on the Masters courses use to reflect on the design thinking process and their team’s progress, the videos of these teams working together give Kingston a rich archive of data on multi-disciplinary team-working, which will be written up by researchers and continually used over the coming year. Part of the Innoversity team is a Psychology researcher who is adding to the research mix by profiling students’ learning styles and comparing the behaviours of the multi-disciplinary teams. Innoversity has already received international interest in this research data archive, including from an Australian professor who will visit Kingston to make further study of the data later in 2010.

Student enterprise and business engagement

In addition to the Innoversity research staff, the Innoversity space houses a Business Development Manager and an Employability Co-ordinator as well as an Enterprise Education Centre, which acts as a Creative Business incubator support.



Health Care Challenge

An Innoversity project to prototype a new heat and moisture-retaining plastic pouch for pre-term babies in maternity wards used a multi-discipline team for rapid idea generation.



Kingston University's
MACE students in action.

Nottingham Trent University



STUDYING INNOVATION PROCESSES THROUGH REAL LIFE PROJECTS

Originally a pathway open to students on the MA in Product Design, the Multi-disciplinary Masters programme at Nottingham Trent University (NTU) has developed into a scheme open to students from five NTU schools: Art and Design; Architecture, Design and the Built Environment; Business, Science and Technology; and Animal, Rural and Environmental Sciences. The programme draws together staff and students from these colleges to address a new set of product innovation challenges posed each year by four to six collaborating companies.



Multi-disciplinary teaching and learning

On the Multi-disciplinary Masters (MDM) programme at Nottingham Trent University (NTU), teams of staff and students from across five schools work together to address product innovation challenges set by collaborating companies.

Traditionally, design undergraduates learn approaches and skills that can be restricted to ‘rehearsing those parts of the innovation process that result in a final plan for how to make a new product or service,’ explains Paul Johnson, Head of product Design at NTU. Staff at the university knew that the innovation of real products out of initial concepts demands a variety of approaches and skills, ones that are more likely to be found in a team of individuals from different specialist backgrounds. The MDM scheme provides students with a greater opportunity to study the next stages of the process, ‘those which involve the realisation of the plan in the market, or public domain’.

The chance to get involved in opportunities to study the realisation process in live projects – rather than just imagining possibilities – has made the programme attractive to both staff and students, Johnson adds, and has encouraged them to cross the disciplinary boundaries that characterise undergraduate study. ‘It opens their minds to different approaches, ones of which they might otherwise have remained ignorant.’ Furthermore, the MDM affords the collaborating companies opportunities to develop awareness of new ideas and skills emerging from academia.

The weighting of specialists in each team is determined by the nature of the project brief agreed between the university and the collaborating company: there is no prescription about the numbers of participants from each disciplinary area. So, for example, one project to develop interior products, such as furniture and kitchen fittings, involved staff and students from the specialist areas of product design, architecture, branding, business and marketing. Another project to develop a new otorhinoscope for nose and ear examinations drew in participants from computing and informatics, product design, display technology and marketing.

Rather than training participants to follow one pre-existing notion of how innovation works, the scheme’s ultimate goal is the discovery and development of fresh approaches to the innovation process. This model of investigation and learning is open to staff and students from across the whole university.

Before commencing projects, the university and its collaborators draw up an Arising Intellectual Property agreement to protect the interests of all concerned. The university is able to offer its partners assistance in formally registering such IPR, not only during the delivery of the project, but in the subsequent process of consolidating and writing up the project outcomes. Two of last year’s partners are presently working with the university in such schemes, and three of the staff involved in those projects are presently preparing papers about project findings.

Student enterprise and research

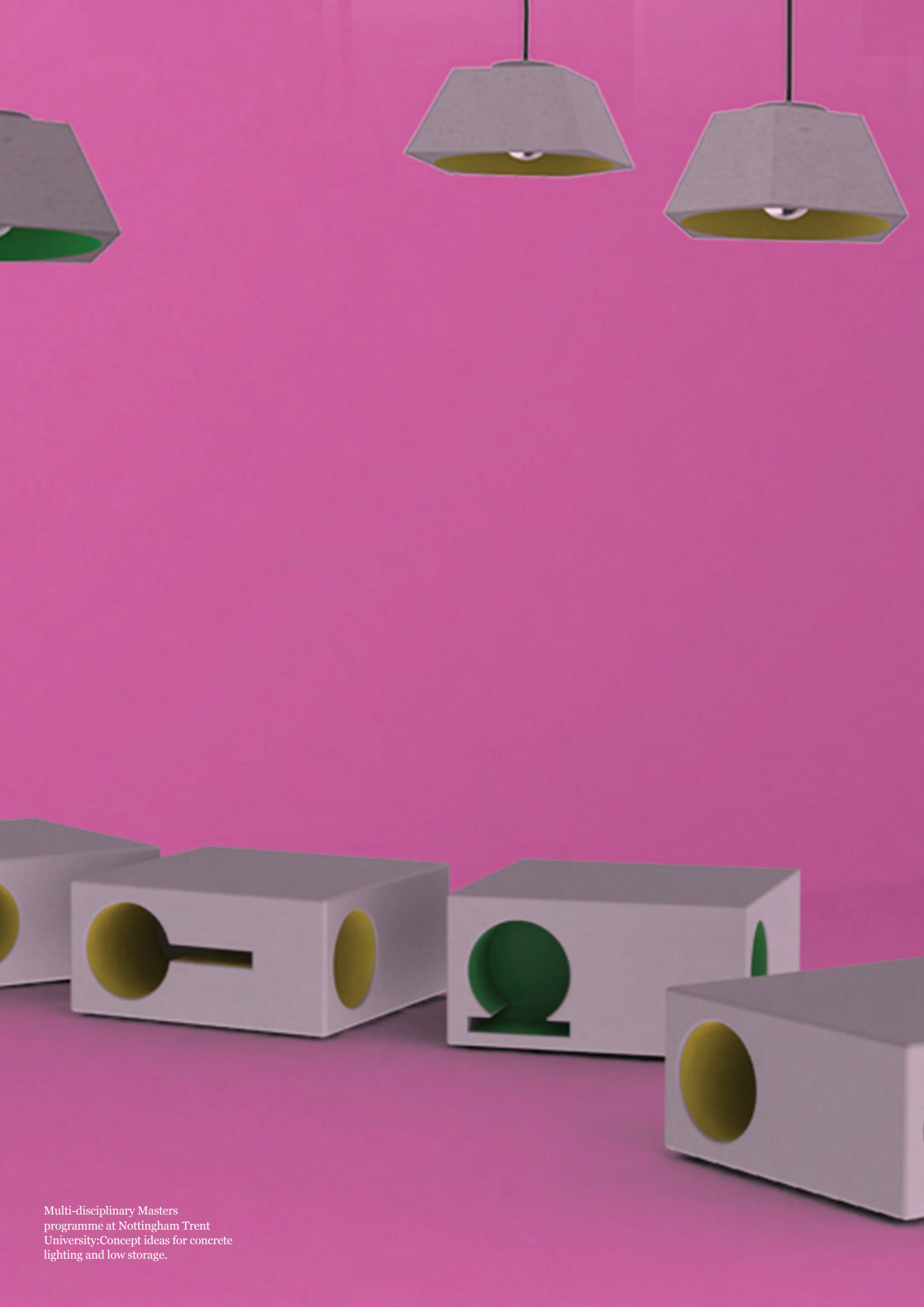
The MDM programme also provides a range of opportunities for participants to follow up on what has been learnt during the project lifetime. They can use some feature of what they have studied as the basis of further academic study at MPhil and/or PhD level, or they can take aspects of the project further by working as an associate of one of the collaborating companies in a formal partnership arranged through the university.

Partnership working is in some instances funded by the university's own Stimulating Innovation for Success (SIS) programme. This is a mainly HEFCE-funded scheme, usually lasting around six months, where a student acts as a link between the university and a company, to collaboratively develop an innovation plan for an agreed project. In other cases students can join the national Knowledge Transfer Partnership (KTP) scheme. This is usually a longer term project and allows greater scope for practical and scholarly research by both staff and students. It can also result in the graduate who is working as a KTP associate gaining permanent employment at the company after the scheme has finished.

NTU students who develop business ideas of their own as the outcome of the Multi-disciplinary Masters can also be introduced to The Hive, an NTU centre established in 2001 with European Regional Development Funding, which mentors new business ideas by providing a combination of training and office facilities. The Hive has seen the growth of over 100 new businesses, including ones set up by recent graduates from NTU Masters programmes.

Multi-disciplinary Masters programme at Nottingham Trent University: Feedback by the Low Info team at an interim presentation of ideas by students on the MA Product Design course.





Multi-disciplinary Masters
programme at Nottingham Trent
University: Concept ideas for concrete
lighting and low storage.

Lancaster University

EMBEDDING DESIGN RESEARCH AND TEACHING IN A
MULTI-DISCIPLINARY CONTEMPORARY ARTS INSTITUTE



ImaginationLancaster is a creative research lab at Lancaster University, which offers multi-disciplinary MA and MRes design courses, design-led PhD research and a combined undergraduate degree in Marketing and Design in conjunction with Lancaster University's Management School. ImaginationLancaster sits within the multi-disciplinary Lancaster Institute for the Contemporary Arts (LICA), which brings together Lancaster's teaching and research activities in Art, Design, Film Studies, Music and Theatre Studies.



Multi-disciplinary teaching and learning

Lancaster Institute for the Contemporary Arts (LICA) was created in 2006 as a multi-disciplinary centre focusing on the Contemporary Arts, bringing together Art, Music and Theatre Studies to form a new institute. It is based in Lancaster University's faculty of Arts and Social Science and also incorporates public arts provision at Lancaster – the Peter Scott Gallery, Nuffield Theatre and Lancaster International Concerts. ImaginationLancaster was developed using funding from a donation from the Bowland Charitable Trust to Lancaster University of £5million over five years.

Professor Rachel Cooper, previously Professor of Design Management at Salford University, was appointed as the Institute's first director, and also director of ImaginationLancaster, with a remit to lead the development of the centre and recruit and incorporate a team of design researchers who would work in collaboration with the other disciplines in the Institute and across the university. 'I saw this as an opportunity for design to be an integrator,' says Professor Cooper. 'Why shouldn't geographers see music and theatre performances as well as people studying performance? What can design learn from dance? We're not a design research unit, there are many of those already in existence. This is more experimental. Designers imagine futures, that's what we do, and here we use design and research to tackle big issues.'

The design team is developing relationships, research and teaching with Lancaster University's research centres: Lancaster Environment Centre, its Management School, its Medical School and InfoLab21 – Lancaster University's centre of excellence for Information Communication Technology. 'I am an evangelist for creativity crossing boundaries,' explains Professor Cooper. 'I'm proud of the creativity designers use but I don't believe designers are the only doyens of creativity.'

LICA's joint multi-disciplinary submission (Art, Design, Music, Theatre, Film and New Media) to the 2008 RAE scored a high grade point average of 3.1 with 80% of its research classed as world (4*) or internationally (3*) leading, which places Art and Design in the top three in its sector.

Alongside a taught MA degree in Design: Management and Policy, ImaginationLancaster offers an MA Sustainability, Innovation & Design course, which includes two interrelated project-based modules where students work with other units on the Lancaster campus, including the Sociology department, the Management School, the Environment Centre and InfoLab21. These modules are also open to students undertaking the MRes Design course, who draw on the multi-disciplinary research capabilities within the centre and can also work with other departments on their final major projects.

From 2010 there are around 40 undergraduate students enrolled on the combined BSc (Hons) Marketing and Design course delivered in conjunction with Lancaster University's Management School. This aims to give students an understanding of design and marketing as both a managerial and socio-cultural phenomenon, as well as developing creative thinking and problem solving skills alongside research, analytic, reporting, team working and presentation skills.

Lancaster's modular undergraduate degree programme means that the first year module on this course, 'Introduction to design' is also open to any first year undergraduate across the university.

Research

Also located within LICA is the HighWire Doctoral Training Centre, a collaboration between Computing, Design and Management at Lancaster.

HighWire offers a four-year training programme beginning with a year of multi-disciplinary formal and practical training, culminating in the award of an MRes, followed by a three-year period of study leading to a PhD.

Its ambition is to produce individuals who are grounded in a particular discipline, but who also have an awareness and appreciation of other disciplines. Professor Cooper describes that this might be, for example, ‘a technologist with an awareness of the challenges of design – manufacturability, human-factors, aesthetics – coupled with an appreciation of the business considerations of developing and marketing digital innovations into services and products for organisational end-users and their customers’.

Funding from the EPSRC Digital Economy programme will enable HighWire to take on ten new students a year for the next five years. HighWire is supported by a range of companies including AT&T, BBC, BT, Clifford Chance, CSMTc, HP Labs, Knowledge Partners, Microsoft, Mott MacDonald, O2 and Sony in addition to 20 micro-businesses and SMEs in the North West.

ImaginationLancaster also supervises more than 20 PhDs studying research through design and the role of design within complex multi-disciplinary organisations and systems. Specific areas of design-led research at Lancaster include the digital economy, service design, democratising innovation, design for sustainability and social technologies.

ImaginationLancaster is situated in the new £10million Lancaster Institute for the Contemporary Arts building on the Lancaster University campus. Here, design researchers and PhDs share flexible spaces with art, music and film and theatre studies students.





Multi-disciplinary teams at ImaginationLancaster using the configurable exhibition and performances spaces in the LICA building.

‘I am an evangelist for creativity crossing boundaries. I’m proud of the creativity designers use but I don’t believe designers are the only doyens of creativity.’

–Rachel Cooper, Professor of Design Management, Lancaster University



Professor Rachel Cooper joined Lancaster University with a remit to develop collaboration between departments and research centres.

Services for industry

ImaginationLancaster and Lancaster Business School also have an ongoing multi-disciplinary collaboration with the Business and Management Schools at Liverpool and Manchester Universities to provide a series of interactive workshop programmes for SMEs through Daresbury Science and Innovation Campus.

One programme, IDEAS at Daresbury (Innovation, Design, Entrepreneurship and Science) was designed to promote effective knowledge exchange between SMEs, large corporations, universities and government funded science. More than 60 regional SMEs, primarily high-tech micro businesses, took part in practical workshops, with academics and researchers from ImaginationLancaster leading sessions on customer focus, branding and visual communication, and collaboration and creativity. One workshop, for example, saw SME managers and technologists try out an approach to problem solving based on movement rather than speech, in order to bring out the fundamentals of creativity and collaboration.

ImaginationLancaster has also run futures and scenario planning workshops with large companies in the engineering and consulting sector, and with PCTs and GP practices on the future of IT in healthcare, devolved commissioning and integrating with other community services.

A multi-disciplinary teaching and performance space

In October 2010 LICA’s students and researchers moved into a new purpose-built 3,000 square metre building on the Lancaster campus. Architects Sheppard Robson have designed the timber-clad building to be as environmentally friendly as possible, and features include translucent cladding which will filter varying degrees of light into the interior, natural ventilation and reduced energy consumption. Flexible teaching, research, exhibition and performance spaces, including a rapid prototyping workshop and black box spaces for interactive experiences, take up two floors of the £10million building with a third floor available for future expansion.

Like the building it now resides in, ImaginationLancaster has benefited from being purpose-built, says Professor Cooper. ‘We had what was effectively a greenfield site for ImaginationLancaster, and we were lucky to have five

years to set it up and recruit a team who would not have to teach in the first year. That enabled us to really think about things – What is research in art and design? How can we use our methods more widely for research?’ While research trips to institutions like MIT provided some of the inspiration for how ImaginationLancaster and LICA could work, Professor Cooper credits the Vice Chancellor and senior management of Lancaster with having ‘the vision’ to see how the centre could work. ‘Of course some days we just looked at each other and said “What are we doing?” And sometimes overseas colleagues understood what we were trying to do more than those in the UK.’ The 14 person team at ImaginationLancaster now includes experts in service design, art and social technologies, spatial design and healthcare design.

Future plans for ImaginationLancaster might include working more closely with the university’s partner companies, such as those involved in HighWire, perhaps by seconding company employees to work with teams within the LICA building. Professor Cooper is also exploring ways in which PhD students could commercialise ideas that have come out of their multi-disciplinary research, perhaps through a business incubation service based in purpose-built pods located within the woodlands on Lancaster’s campus. This, she explains, would add value to everyone’s experience of working within the institute. ‘For a designer, and I always say my core is design but my experience is wider, learning about anything, being exposed to new content, can only be a source of inspiration.’

The HighWire Doctoral Training Centre at Lancaster University, a collaboration between Computing, Design and Management, is supported by the EPSRC and works with a range of organisations including the BBC.



University College Falmouth

PROTOTYPING A MULTI-DISCIPLINARY TEAM PROJECT IN ADVANCE OF
CREATING A NEW ACADEMIC RESEARCH AND DEVELOPMENT CENTRE



University College Falmouth will formally launch its Academy of Innovation and Research (AIR) in 2011, a £9million investment which will operate as a multi-disciplinary research and development laboratory and as a creative facilitation space. In advance of this, University College Falmouth has been testing approaches to multi-disciplinary team-working on a service design project for Dott Cornwall, funded by the Cornwall Council, the Design Council, and the Technology Strategy Board.



University College Falmouth (UCF), incorporating Dartington College of Arts, is a specialist arts college with two schools: Art and Design, and Media and Performance. In 2011 UCF will open the £9million Academy of Innovation and Research (AIR). Using a combination of regional, European and HEFCE funding, AIR will operate as a multi-disciplinary research and development laboratory for UCF. It will include a design innovation centre, which will enable researchers and business development staff to work with businesses in flexible project teams.

A multi-disciplinary teaching and facilitation space

A new AIR building is planned to open at the Tremough Campus in spring 2012. At the heart of the building will be a technology-rich, 3D enabled, interactive 'Sandpit' for creative idea generation. This experimental space will incorporate collaboration and visualisation software, and will help businesses to scope new projects and collaborate with their clients in new ways. Alongside this will be space for researchers and academics to develop their own multi-disciplinary live project work. The new building will be located at the heart of a campus with unrivalled facilities for a full range of product and service prototyping, including workshops, film studios and digital animation labs.

Research themes

AIR will focus on two areas of research, chosen because they have a particular resonance for Cornwall as well as national relevance. The Centre for Sustainable Design will focus on product, service, infrastructure and community design for a low carbon economy and sustainable society. The Centre for the Digital Economy will help high growth businesses to harness the competitive advantage of superfast broadband (£132million is being invested into the next generation of broadband in Cornwall over the next three years) and to increase the value of digital content.

Projects at AIR will be multi-disciplinary, ranging across both themes and covering topics, such as future transport and mobility solutions, health and wellbeing in an ageing population, digital inclusion, eco-towns and sustainable development.

Teaching and services for business

By 2012 AIR will also have developed a new entrepreneurial business-facing course portfolio. Aimed in part at Cornwall's creative businesses, this includes courses designed to enable students to set up and launch businesses as a central part of their studies, new forms of flexible CPD and postgraduate provision for those already in work. Staff at the multi-disciplinary centres for Sustainable Design and the Digital Economy will also contribute teaching on undergraduate and postgraduate courses.

‘AIR will be one of the most significant developments in building the new relationship between Higher Education and industry that we looked for when writing the Digital Britain report.’

–Andrew Chitty, Chair, National Skills Council for Interactive Media

A prototype multi-disciplinary research and service development project

AIR will ultimately run around six multi-disciplinary research projects a year. In summer 2010, prior to the launch of AIR, a small multi-disciplinary team was formed to work on a local transport project as an early prototype.

The project, called ‘Share the Road’, looked at the best way to provide sustainable, user-centred transport solutions, which would be used by Falmouth and Penryn residents, visitors to the area, as well as students on the Tremough Campus of UCF. As part of UCF’s collaboration with Dott Cornwall, a year-long programme of community-based design projects in Cornwall in 2010 funded by Cornwall Council, the Design Council and the Technology Strategy Board, it was, says John Miller, director of AIR, an ideal live project with which to prototype how a multi-disciplinary AIR project team might work together. ‘AIR is very much built on the ideas from the “Cox Review” about multi-disciplinary teams,’ he explains. ‘We wanted to simulate what an AIR project would be like at this early stage, but of course we don’t yet have any of the people, live projects or even buildings that AIR will have. So, because we don’t have our own postgraduates yet, we decided to borrow other people’s.’

UCF advertised four three-month positions for recent graduates from different disciplines to come to Cornwall and work together on the project, and received more than 100 applications. One position was filled by a graduate from UCF’s BA 3D Design for Sustainability course, another by a graduate with an MA Management from the University of Derby who had extensive experience of the voluntary sector. The remaining two roles were filled by graduates on the MDes Innovation and Creativity in Industry course at the Centre for Competitive Creative Design, C4D (London College of Communication and Cranfield University), one with a BSc in Electronic Engineering from Queen Mary’s University of London and the other with a BA Product Design from Central St Martins. This connection between the established multi-disciplinary centre at LCC / Cranfield, and the fledgling centre at UCF came about through both organisations’ membership of the Multi-Disciplinary Design Network, and John Miller credits it as being vital for the viability of the project. ‘Both the graduates from that course were excellent, and a real credit to the work that is going on there.’ In addition, Rory Hamilton, an experienced service designer, formerly at service design consultancy live|work, joined the team in a mentoring role. The ‘Share the Road’ team’s challenge was to develop a prototype transport sharing service for the area of Penryn and Falmouth which has huge traffic and parking problems exacerbated by seasonal influxes of students and tourists.



Graduates on the 'Share the Road' project prototyped service ideas with stakeholders before testing their viability with local residents. Photo: Emma Dyer.

The team began by analysing and visualising recent transport surveys by UCF, Tremough Campus Services and Cornwall Council, to uncover why and where people drive in the area, and to understand the current public transport structure. They also spent time identifying key members of the community who would be stakeholders and participants in the project. However the majority of the time was spent working directly with users to co-design solutions. Techniques used included interviews, observation and hands-on participation at workshops both at the college and within the community by a presence at local fair days, and meeting people at their places of work and leisure. This was followed at a two-day workshop with key stakeholders and experts including car-share service providers, local surfers' groups (UCF students often need a car because they want to carry a surfboard) and Cornwall Council's Green Travel Plan co-ordinator. Two days after this 'Sandpit' event where service, delivery and brand ideas were sketched out, the ideas developed were tested for viability at a residents' workshop.

Using Dott Cornwall's methods of community engagement alongside the design, electronics and business expertise within the team, the 'Share the Road' team has been able to prototype a car and bike sharing club concept with the key elements that make it appropriate for its potential users – for example, it is text-message based and works on a turn-up-and-go principle, but elements of the service would be delivered face to face or by phone because members of the community wanted there to be some human contact involved. The project is now at business planning stage, with an experience prototype nearly ready to show potential funders and local stakeholders. John Miller describes the process of working with a multi-disciplinary team as very instructive and that many of the learnings from this project will be used to refine the way AIR projects will run. 'We learned an awful lot,' he explains. 'For instance, next time I would spend more time at the beginning of the project

orientating the whole team, getting them used to working together. For some people this will be a completely new way of working, and you can't expect everyone to fit into that straight away.' The team themselves agree, each describing points of frustration when the project was moving in ways that were unfamiliar to them – for designers this included SWOT analyses and demands for quantitative research, while business specialists had to get used to the designers' desire to sketch out ideas and visualise information. One team member suggested that having a psychologist as part of the team would have helped them understand both their stakeholders' motivations and their own reactions to the process.

All agree, however, that the project had taught them a huge amount, and pointed to the inclusion of an experienced service designer as a mentor as a key contributor to this. John Miller says the team has developed 'a good, saleable proposition' in just three months, and hopes to be able to share learnings from the process more widely in the spring of 2011 when AIR is formally launched.

Service Prototyping

The multi-disciplinary team on the Share the Road project have prototyped a turn-up-and-go car and bike sharing scheme that is based on text messaging. Photo: Emma Dyer.



Emerging Challenges

When Sir George Cox envisioned ‘centres of excellence’, which would ‘act as pacesetters’ for multi-disciplinary teaching and research in the UK’s universities’ he acknowledged that ‘it is not always easy to establish links between different faculties and institutions. (...) but I believe the prize to be well worth the effort.’ Some shared challenges identified by the academics we spoke to are briefly sketched here, and might provide areas for further research and discussion.

People, relationships and culture

Many of the academics we spoke to emphasised that the impetus to set up new courses, change established ways of working and bring innovation to sometimes entrenched university departments ultimately depended on the enthusiasm and energy of individuals. Others commented that collaboration between departments or institutions is in practice a collaboration between individuals, and personality plays a huge part in the success of any joint project. Senior support and advocacy is a must for developing and running multi-disciplinary courses across departments or different institutions.

Timescales and proof of concept

Almost all the academics highlighted that funding for three years is not long enough to show proof of concept for new courses, research projects or business incubation centres. It takes time to build the relationships between individuals and departments upon which successful multi-disciplinary projects depend. Some suggested that expecting new courses to be developed, iterated and improved within such timescales did a disservice to the ethos and ambitions of multi-disciplinarity and ran counter to the design process.

Course titles and student recruitment

More than one course director mentioned that, were they to undertake course development again they might change its name, either to better reflect course content or to 'sell' the course more effectively to certain types of students.

Design's role in the university

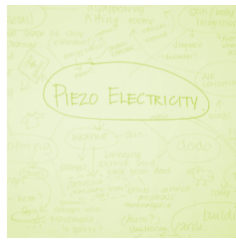
Some academics, from both within and outside design departments, warned that designers should not be protective of their discipline if multi-disciplinary projects were to succeed. This might mean designers being more willing to accept that their methods might need to be adapted, and less willing to claim ownership for concepts and processes that also exist in other disciplines. As one academic put it, 'You can't just wander into a business school and say "Design is innovation!" It won't get you anywhere.'

Measuring impact

Few of the academics we spoke to volunteered information about how the success of their multi-disciplinary programmes would be measured. Aside from institutional performance indicators such as meeting student recruitment targets and generating research funding, it is unclear how the the impact and value of these programmes will be assessed, and whether they will need new forms of evaluation.

Personal and professional satisfaction

Despite these challenges, academics from all institutions articulated how personally and professionally rewarding it was to work on multi-disciplinary programmes, and talked about how exciting it was to be involved in them.

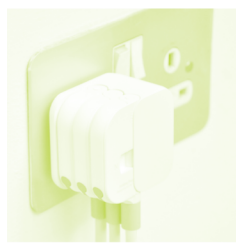
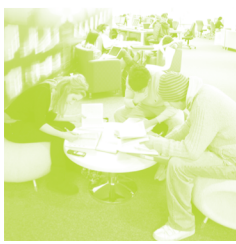


The **Multi-disciplinary Design Network** was formed in 2006 and is run by the Design Council, in partnership with NESTA and HEFCE.

Design Council is the national strategic body for design. Its mission is to inspire and enable the best use of design in the UK so that it is the most competitive, creative and sustainable nation.

The **Higher Education Funding Council for England (HEFCE)** distributes public money for teaching and research to universities and colleges. In doing so, it aims to promote high quality education and research, within a financially healthy sector. The Council also plays a key role in ensuring accountability and promoting good practice.

The **National Endowment for Science, Technology and the Arts (NESTA)** is an independent body with a mission to make the UK more innovative. They invest in early-stage companies, inform policy, and deliver practical programmes that inspire others to solve the big challenges of the future.



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