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## **FINAL DRAFT 06**

### **Knowledge Exchange *through* the Design PhD**

Ben Dalton, Tom Simmons, Teal Triggs

Follow the hum of enlivened voices and the buzz of activity gradually comes into focus as you round the stairwell up to the 5<sup>th</sup> floor studio in the School of Communication, Royal College of Art (RCA). Enter the studio space and 3D printed shapes, yellow post it notes, exposed electronics, measured lengths of string, experiments with silk, and card pinned to the studio walls all denote research in progress. In one network structure visualisation we see a method of identifying keyword searches, in another tactile representation of digital networked relationships. The white topped desks, laptops and angle poise lamps give a sense of a working design studio, even replete with suitably designed upholstered chairs. However the biotech equipment on one shelf, theatre maquette on another, smart sensor prototype on a third suggest a design studio that has been complicated by less familiar practices and collaborations. This interdisciplinary studio is shared between the School's postgraduate research degrees students and six of the 21 students registered to the Creative Exchange Hub (CX) – an Arts and Humanities Research Council (AHRC) funded consortia of three UK universities led by Lancaster University with Newcastle University and the RCA. (1) The CX Hub emphasizes ongoing academic development and university research cultures by placing a substantial cohort of PhD researchers at the core of each step of the knowledge exchange process - from partnership building to proposal development and funding bid formulation, to research, prototype development and evaluation, analysis and review.

The CX Hub emerged out of shifting contexts fuelled by new UK government policies and global economic drivers. The CX Hub took the contested theme of 'digital public space' as its research focus, but is also shaped out of digital public spaces itself, out of affordances of digital connectivity, complex on-demand networked resources, and their personal, social, cultural and political implications. In the CX Hub the emphasis on digital public space(s) encompasses a breadth of initiatives, from supporting the development of online spaces to make the assets of national cultural associations more accessible, enhancing understanding of the open and/or shared data protocols and practices of local authorities and government, raising awareness of the flow of social media and its implications for individuals and groups, and investigating the influences of digital public spaces upon lived human experiences. The CX Hub is one of four AHRC funded Hubs that have each explored how a range of organizations including commercial, non-commercial and academic parties might better collaborate. In the CX model, established approaches to academic research and the

relationship to fostering the creative industries whilst enhancing business innovation was reconsidered. This in turn, became a catalyst for exploring a new and innovative research degree model in order to inform and shape future innovation and research within and between the UK's creative industries and academia. The CX Hub was launched in 2012 and set out to develop new thinking under the theme of digital public space with the main aims to develop new services, products, technologies and policy interventions; establish new forms of knowledge exchange between academia, industry and communities; and, at the same time, develop individuals skilled in knowledge exchange through an innovative PhD programme focusing on design and knowledge exchange. A new PhD model for design has been developed where the PhD student is situated at the centre of a knowledge exchange context and process, which is underpinned by a series of short-term collaborative projects with academics and industry partners.

This paper will introduce the CX PhD model and propose its value for design research through the relationships formed between academics, industry partners and PhD researchers. By emphasising the development of expertise in generating ideas, engendering exchange, managing cross-sector relationships and developing collaborative design-based research, the PhD student is well equipped to contribute to informing and shaping future interrelationships between academia and the creative industries. The CX model has the potential to address how designers navigate an increasingly complex context of wicked problems and digital networks. The notion of a lone scholar is no longer viable in order to address such 'real world' design challenges. This paper introduces the concept of 'interorganizational' research as applied to the experiences of RCA CX PhD researchers and their supervisors based at the Royal College of Art who have worked with academic and non-academic partners in order to build new knowledge in the design, production and use of digital public spaces.

### **Characterizing the CX PhD Model**

The CX model operates through a series of collaborative projects focussing on the theme of digital public space in which the PhD student's own research is situated. (See diagramme 1) The centrality of the PhD in the Creative Exchange structure, process and scale (with a cohort of 21 researchers) provides a unique opportunity to examine the role of doctoral researchers in interorganizational research. We can begin to identify features that characterise research across numerous short-term funded projects and their partnerships, and elements that might even distinguish this type of student research as a new form of knowledge exchange *through* the design PhD. At the same time, this model suggests that whilst knowledge exchange is itself a focus for some of the CX doctoral researchers, it is more commonly seen as a method

for undertaking collaborative research in support of developing innovation: research *through* knowledge exchange.

The roots of interorganizational research are found within the literature of marketing and management where the term often refers to firms who 'must seek cooperative relationships with other firms' especially within competitive environments. (e.g. Kumar, Stern and Anderson 1993) More recently, scholars have written about social network perspectives and applied this approach to interorganizational models. This posits a move beyond a 'self-reliant view of organizational action and outcomes to one that is essentially relational.' (Zaheer, Remzi and Milanov 2010: 63). In technology research, head of MIT's Media Lab, Joi Ito (quoted in Copeland, 2012) has called for interorganizational research models that reflect the on-demand, digital, networked resources of Internet start-up, and free and open-source software cultures. In the case of the CX PhD interorganizational describes a series of research and innovation orientated collaborative partnerships where short-term projects have been negotiated *through* the aims of the PhD research. The 'lens' through which the majority of the RCA's CX collaborative projects are developed is that of communication design. Here the collaborative approach is facilitated through an act of making and in doing so, the CX researcher is a participant in transferring and sharing knowledge between one (or more than one) organization and another.

Interorganizational collaboration can be thought of as extending interdisciplinary research approaches. Interdisciplinary research emphasizes dialogue and exchange across university departments and fields of thought. The value of interdisciplinarity has been recognised in the richness of the outputs and in a shift from individual academics seeking out collaborations, to institutional structures of collaboration (Blackwell, Wilson, Street, Boulton, & Knell, 2009). This can be seen in the history of university departments like the University of Cambridge Crucible research network and the MIT Media Lab, and the approach of large research and development labs including Xerox Parc and Bell Labs.

One of the main characteristics of the CX PhD is its position in both design practice and digital connectivity. The research approach is one of concurrent, multi-organizational projects that demand adaptable, collaborative forms of research practice. When working with non-academic partners, traditional models of knowledge exchange have often drawn upon multiple disciplines. The differences and similarities between fields of thought encourage and require interdisciplinary thinking. However, by extending a conventional collaborative PhD process from one to many research partners, and one to many knowledge exchange processes,

the CX has established a doctoral research approach that is not only interdisciplinary but also interorganizational. Interorganizational research then is encouraged and required by the differences and similarities between organizational contexts of practice in the CX projects.

What is the experience of this interorganizational research process, of concurrent, multi-organizational projects that demand adaptable, collaborative forms of research practice? We might think of it as a form of sampling and data collection through project-focused design practice. For example, two CX projects run by one of the doctoral researchers near the beginning of the CX Hub had very different public events in the same month, but led to common emerging themes on which to ground theoretical development. One project used a week-long ethnographic and participatory design method to develop a workplace app for freelancers at a large media organization. It was driven by questions of fragmenting work routines and workplaces. The project was a collaboration with an architecture school and an office space consultancy company, and the design that emerged emphasised subtle, personal communication in small teams through the sharing of pictures of desks and workspaces. The second project was quite different, it used a critical speculative design approach to launch an intentionally privacy-violating public space ‘brand’ and ‘service’ at an art festival, in collaboration with artists, computer programmers and festival organisers. It was driven by concerns around social media data harvesting. The design involved a performance of conversation recording and web publishing in a fake cafe, and emphasised critical arts practice, communication design branding and public experiences of personal data. Taken together, these two projects, both products of multiple partner organizations and research cultures, have contributed rich insights to the doctoral research from which themes of personal identity design in the age of digital networked data have been developed.

### **Messiness of Design Research**

Our research hub draws on models of design research to demonstrate and test *knowledge exchange* driven by approaches taken from creative practice. Each of the three university partners has histories of innovative applied design research. We can characterise creative practice in design as collaborative and adaptive, suited to ‘messy’ and uncertain challenges. Traditional academic knowledge exchange can have a tendency to be driven by structure and bureaucratic patterns. Design research scholarship has recognised this trend (Jones, 1977), and pursued more adaptive and collaborative approaches – in part through the influence of the daily practice of designers and design studios. Research insight in design practice is often drawn from the intersection of multiple projects, clients or briefs. By using design research approaches the Creative Exchange is therefore characterised by drawing on not only multiple

disciplines but also multiple organizational contexts. This shift beyond interdisciplinary to interorganizational thinking defines the CX PhD and emerges as a product of the applied design research expertise of the CX Hub co-investigators.

Our hub has focused on research questions concerning the theme of digital public space, a topic that is well suited to research methods that can meet demands of growing complexity and rapid connectivity. Interorganizational research in digitally connected networks shapes doctoral researchers that are comfortable drawing dynamically on diverse organizational and intellectual resources. However, additionally, this research approach also acts to shape the participating organizations, both universities and partners, to better suit digitally connected collaborative contexts. For example, in a project about personal data stores, a commercial partner speaking at a design workshop organised by the CX researcher saw a design idea about a solid stone memory store. The sketch idea triggered a conversation about the scales of a lifetime of data, that in turn led the partner to build a prototype app with 50 years of test data where before they had tested with a year of data at most. In the same project, a partner university struggled to allocate an academic to such a short project using traditional Full Economic Costing and departmental approval process intended for much larger and longer projects. The CX student and academic had to develop a workshop series as an alternative collaborative process instead. Both organizations found their cultures and practices shifting through the CX knowledge exchange hub and the PhD student involved.

### **Supervising the CX PhD**

Interorganizationality brings with it certain challenges for supervisors. The supervisors as well as the PhD researchers are on a journey in shaping and managing multiple projects and partners. The convention of what a PhD is still holding true - rigour, systematic approaches, and identifying a contribution to knowledge. But then whose knowledge and knowledge exchange, and how is this evidenced? A broader concern is also to articulate what the PhD might be as a result of operating within the CX Hub context – a process which has essentially informed and potentially enhanced the research and its outcomes.

In many traditional, established academic subjects, doctoral supervisors are able to provide a subject overview. Their specialism allows them to develop a working mental model of the current research landscape, to suggest potential areas of fruitful investigation, to quickly assess claims of originality and to suggest appropriate research methods. Interdisciplinary academics, including those in fields such as new media, in which specialisms are less well defined, are often not able to provide such a succinct overview. Supervisors of

interdisciplinary PhDs are not expected to have mapped each potential discipline in full. Instead, the approaches for navigating multiple perspectives and methods become key to what supervisors offer. In interdisciplinary PhDs, supervisors may also draw on an established project network to suggest appropriate collaborators and specialist resources.

We can think of an interorganizational PhD as one in which the doctoral researchers cannot expect to look to the supervisor for an overview of all the available collaborators and resources either. Instead the form of the PhD is characterised by the student finding and maintaining connections directly. Here, not only is an emphasis on navigating multiple perspectives and methods vital, but also strategies for organizational collaboration. The supervisor's key expertise becomes guiding the student in approaches to working with many organizations effectively within overarching research objectives. As is the case with the Creative Exchange, supervisor involvement in setting research agendas and distributing organizational collaboration funding helps to drive interorganizationality within the PhD programme and individual doctoral researchers. Co-investigators and tutors with significant experience and expertise in managing interorganizational research labs and projects formed the CX Hub. A process of network building, partner consultation, thematic scoping and project development 'sandpit' events were created by the CX Hub in advance of recruiting the doctoral researchers. The sandpit events were instrumental in informing and framing collaborative research, knowledge exchange and innovation opportunities, contexts and challenges, particularly for projects in the Hub's early stage of operation. More recently and particularly at the RCA, these initiatives have been led more directly by CX PhD researchers working with their supervisors and the CX Hub's core team of investigators, using a more varied set of approaches motivated by discrete research orientations and developing networks. Challenges for the supervisor also reside in the handling of what added value of the CX PhD context may provide the student. This is in the form of supervisors and co-investigators 'managing' partnerships so that the student is benefiting from first-hand knowledge of skills needed to successfully project manage and develop life-long learning skills in negotiation and listening. At the same time, the relational aspects of the CX PhD also means an understanding in the management of partnership agreements and keeping an eye on 'intellectual property' agreements, which may also require additional training and support from university research offices.

### **Towards Interorganizational PhDs**

Interorganizational processes and networks shape the CX PhD research journey and thesis outcomes. (See diagramme 2) We have outlined above a trend from traditional, field-specific

PhDs, to interdisciplinary doctoral research, to a form of interorganizational PhD. The trend describes a growing breadth of PhD approaches, with space (and perhaps necessity) for all three forms of PhD in a contemporary research context. Within the finite time limits of a UK PhD programme and word count limits of a thesis, differing emphasis must be placed in each form of PhD on differing parts of the process and documentation.

A traditional single discipline, single organization PhD is generally focused on mapping a subject specialism within a strongly defined discipline in the context of a particular university institution. The approach is suited to reaching the edges of a single subject. It offers a deeper understanding in order to map, analyse and progress a theoretical position. Methodology must be articulated, but is often one of several well established within a field.

An interdisciplinary PhD emphasises mapping of methodologies and perspectives. A researcher must go deeper in finding ways of synthesising points of view and identifying conflicting assumptions. The approach can reach areas of focus that fall outside or between disciplinary boundaries. Interdisciplinarity also suits bringing methods of one field to bear on another, or appropriating resources. An example of technical resources would be the use of early computer science facilities at night to develop novel approaches in architecture (Negroponte, 1996).

What then does an interorganizational PhD concentrate on mapping? Following the trend, it would seem that mapping organizational resources and collaborative methods are important – finding ways to synthesise resources and perspectives across disparate research and practice cultures. An interorganizational PhD might be expected to draw on multiple institutional frameworks, and to use not only a multitude of methods and perspectives, but also resources for carrying out all aspects of the practical process. Ito (quoted in Copeland, 2012) describes research methods that draw on (digitally) networked resources on-demand like this in terms of networked software that ‘pull’ request resources from a network ‘just-in-time’.

### **Risks in New Forms of PhDs in Design**

If we look again at the example of the interdisciplinary PhD we can extrapolate some of the challenges faced by interorganizational PhD researchers, supervisors and institutions. As the potential of interdisciplinarity has been explored through projects, university structures and PhD programme design, tensions emerge between academic traditions and research innovation (Cross, 2007). We can draw on these tensions to understand more of the potential challenges and opportunities facing interorganizational doctoral programmes.



Academics approaching interdisciplinary collaboration from an established position within a field and institution are able to speak with a voice of an authoritative expert. The traditions of academic progression and structure signify trust and aid confidence in collaborators unfamiliar with other disciplines. Newly graduated postdoctoral researchers from a traditional form of PhD have had time to build a close relationship with a department or school, and with a specialist subject research community. Conferences and publications are also largely organised around disciplines.

Interdisciplinary PhD researchers, on the other hand, are able to develop experience of multiple disciplinary methodologies, and languages (or dialects) of research, but at the cost of strengthening their position within a single field. They will often face academics within several fields in the process of their PhD and viva examination who see them as disciplinary outsiders, and they may have to overcome issues of domain expertise and trust in each new paper and project.

Interorganizational PhD researchers not only position themselves across multiple disciplines, but also across several organizations. They gain a greater understanding of collaborative processes and a range of organizational research cultures, but at a cost of less time to establish an intellectual and social position within a single institution. They will often encounter an outsider status in each organization and discipline they operate, including their 'home' university and department. However, as with the benefits of interdisciplinary 'discipline multilingualism', the benefits of being a 'nomadic interorganizational native' may outweigh the difficulties.

We have to acknowledge that an interorganizational PhD may need to shift the focus of 'depth' from subjects and perspectives to systems. Where a traditional PhD might go deepest in theoretical analysis, and an inter-disciplinary PhD might place emphasis on evaluating differing methodological or technical approaches, an interorganizational PhD may need to emphasise something of the organizational structures in the context of the research. However, there are institutional expectations within universities such as the tacit narratives of traditional disciplinary research often found within research methods and supervision, and the wording and structure of annual processes and final assessment that researchers and supervisors must contend with.

The established traditions of doctoral process and assessment across academia also seem biased towards the traditional research model of single discipline and single organizational context. The Framework for Higher Education Qualifications in England, Wales and Northern Ireland describes the second of four criteria for the award of a doctorate as:

‘...a systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice...’ (QAA, 2008: 24)

The emphasis on a singular academic discipline or area here might still allow for an interdisciplinary and interorganizational approach; either by describing the interdisciplinary context as a new disciplinary space, or by arguing that an area of professional practice demands an interorganizational approach. However, this phrasing leaves little room for exploration of the interdisciplinary and interorganizational contexts suggested by the new form of PhD we have highlighted thus far. Similarly, in the UK the history of the Knowledge Transfer Partnership process – and other approaches in individual institutions – tend to focus on a single project established by a single supervisor and partner organization, often in advance of recruiting a PhD student. (See, for example, Gov.UK, 2015)

Traditionalism within the stages and expectations of the doctoral process help to ensure consistency of academic excellence, but also pose a challenge to shifting demands on the requirements of doctoral training. A research approach that places less weight on academic disciplines may be criticized as lacking discipline altogether. Supervisors, researchers and research communities like the CX PhD must therefore be explicit about intentions and critical position.

### **Learning From The Arts**

Despite some traditions of cautious and conservative disciplinary definitions of design research, design and the arts also have a long history of consideration for progressive approaches to doctoral structure and assessment (Koskinen, Zimmerman, Binder, Redstrom, & Wensveen, 2011). The RCA – as with many art schools – has predominantly fostered research *into* art and design with a single disciplinary focus of historical, aesthetic or theoretical depth (Frayling, 1994). However, the design and art school context of the RCA also has a strong tradition of setting out the benefits of the PhD by practice, and research *through* art and design (Frayling, 1994), as key drivers in producing successfully applicable research. The existing RCA models of PhD by practice have provided case studies of

successful doctoral approaches to documentation and assessment of design-researchers, as well as modes of assessment and supervision that recognise the shifting role of the academic support and guidance required.

Co-investigators from the School of Communication and the Helen Hamlyn Centre for Design have shaped the Creative Exchange at the RCA – two overlapping design communities which are explicitly focused on collaborative design-research practice with networks of partners and participants. The School of Communication is characterised as a ‘culturally connected and fluid environment [...] grounded in experience and expertise’ motivated to ‘help build a better world’ (Brody quoted in Reeve, 2015), and the Helen Hamlyn Centre for Design is exemplified by ‘inclusive and interdisciplinary’ design research with ‘business, academic, government and voluntary sector partners’ (HHCD, n.d.). The designer-researcher and artist-researcher tutors at the College bring with them theoretical and methodological sensitivity (Bryant & Charmaz, 2010) that is often interdisciplinary and interorganizational in nature. Arts practice is nuanced and networked, taking into account complex interactions of social and organizational systems. Similarly successful design is often measured by practical use, either as working (networked) prototype, or when tested within commercial or social systems.

The Creative Exchange provides a fertile context for exploring the form of an interorganizational PhD, in part because of its synthesis of digital and arts perspectives. One RCA PhD CX researcher is exploring what we might be able to transfer from arts practice, for example, to better understand design and knowledge exchange. The focus on digital public space brings the agile, start-up, networked expectations of ‘post-internet’ interorganizationality (Copeland, 2012). It is not just that the Creative Exchange proposes new forms of PhD as part of its knowledge exchange process, but that it is vitally positioned to explore the new forms of PhD that are inevitably emerging from shifting demands of, and opportunities for, academic research and interorganizationality in digital public spaces. The CX Hub has offered a valuable opportunity to extend the understanding and potential feasibility of this PhD model by positioning it within a history of creative practice, drawing from the insights and experience of arts and design research, and by advancing a cohort of 21 doctoral researchers through the programme simultaneously.

In his seminal text on research in art and design, Christopher Frayling (1994) set out three potential forms of research that he had observed in art education and at the RCA in particular. Research *into* aspects of art and design, research *through* the process of art and design, and

research *for* supporting the act of doing art and design. We might borrow and adapt his terms to describe the Creative Exchange design research process in the context of the RCA. Many previous art school knowledge exchange processes could be considered as primarily knowledge exchange *into* or *for* the design PhD – straightforward exchange with an organization to provide a theoretical position or process that the PhD looks *into*, or exchange with an organization that generates reference materials *for* the PhD. The Creative Exchange on the other hand, it could be argued, provides an emphasis on a form of knowledge exchange *through* the design PhD. The process of initiating, coordinating, developing and documenting interorganizational projects and networks through the duration of the PhD by the doctoral researcher drives novel and valuable knowledge exchange between the networks of organizations and individuals involved.

## Notes

1. Professor Rachel Cooper, OBE at Lancaster University is Principal Investigator and Director of the Creative Exchange Hub. Professors Neville Brody and Jeremy Myerson, based at the Royal College of Art, are two of the Hubs nine co-investigators. Full details of all three universities and the 21 CX PhD researchers and their projects, are available online: <http://www.thecreativexchange.org/>

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## **Biographies**

**Ben Dalton** is a Principal Lecturer in the Faculty of Arts, Environment & Technology at Leeds Beckett University, and an AHRC funded CX doctoral researcher at the Royal College of Art, London. His research is focused on the field of Identity Design, including technical, social, political and aesthetic aspects of identity in digital public space. Ben has a background in ubiquitous computing and mobile sensor networks from the MIT Media Lab, Boston, and has conducted research in the Århus University Electron-Molecular Interaction group, University of Leeds Spintronics and Magnetic Nanostructures lab, and Jim Henson's Creature Shop, London. Recently he has been a regular guest Professor at the Bergen National Academy of Art and Design, and co-investigator on two EPSRC funded research projects in digital urban space and wearable computing sensors. He co-directs *Data is Political* on art, design, and the politics of information.

## **Tom Simmons**

Tom Simmons is Research Leader for the School of Communication, Royal College of Art, London. He is a practising designer with a specialist interest in applications of sound and

computation in social design. He has collaborated with artists, designers, writers and scientists in the UK, Europe, Canada, Japan, China and the US, and his work has been presented across the world. He co-led the AHRC funded Design as Human Interface research training and skills for the digital economy programme, and currently leads on the RCA's role in the Creative Exchange (CX) AHRC knowledge exchange hub. CX brings academia and business together to enhance human engagement with digital public space, exploring new forms of connectivity and interactive online content. He is an experienced PhD supervisor.

**Teal Triggs** is Professor of Graphic Design and Associate Dean, School of Communication, Royal College of Art, London. As a graphic design historian, critic and educator she has lectured and broadcast widely and her writings have appeared in numerous edited books and design publications. She is co-editor of *The Graphic Design Reader* (Bloomsbury); her previous books include *Fanzines* and, *The Typographic Experiment: Radical Innovations in Contemporary Type Design* (Thames & Hudson). Teal is Editor-in-Chief of the academic journal *Communication Design* (Routledge/ico-D); co-editor of *Visual Communication* (Sage) and Associate Editor of *Design Issues* (MIT Press). Teal is an experienced PhD supervisor in design and is co-supervising four of the CX PhD researchers.

### **Captions**

Diagramme 1: Mapping the relationship between the Creative Exchange Hub PhD researcher, academic and non-academic partners.

Diagramme 2: Mapping a model for the Creative Exchange Hub PhD research process.