Critical Design at the Royal College of Art and its impact on design and the public understanding of science

1. Summary of the impact

Dunne, Raby, and their colleagues' research into Critical Design at the Royal College of Art (RCA) since 1997 has influenced the methods and ideas of design practice through inclusion in major design exhibitions, conferences, expert collaboration with companies, and coverage in the press, TV and film. Moreover, it has had impact on cultural life and public discourse, by enhancing public understanding of major issues and challenges posed by science and technology for individuals and society, through design research and exhibitions in major international museums, and inclusion in public museum collections.

2. Underpinning research

Critical Design, now an accepted term, was first articulated as a coherent design approach and set of ideas in Hertzian Tales (1999, 2006) [s3.1], written by Anthony Dunne while a senior research fellow in the RCA Computer Related Design Research Studio (1994–2002). During this phase of the research the emphasis was on challenging mainstream approaches to designing technology for everyday life and developing new ways of designing that allowed for subtle human needs to be met. It was developed on three levels: 1) as theory, e.g. Hertzian Tales [s3.1]; 2) through applied research addressing complex issues in externally funded multi-partner research projects, e.g. PRESENCE (Gaver, Dunne et al., 1997–9) [s3.2] and FLIRT (Raby et al., 1998–2000); and 3) through individual practice, e.g. the Placebo Project (Dunne, Raby, 2000–1) [s3.3].

From 1998, Critical Design moved beyond a narrow digital focus and began to connect with broader societal issues. It also began to feature in international design exhibitions, conferences and the design press (e.g. the 'Stealing Beauty' exhibition at the ICA in 1998 and the British Council's touring exhibition 'Lost and Found: Critical Voices in New British Design' in 1999).

In 2002, the research focus shifted to the application of Critical Design to new areas such as biotechnology and exploring new roles for design in relation to science research. RCA researchers were commissioned to develop Critical Design projects exploring biotech and other science-related issues by the Science Museum in London in Is This Your Energy Future? (Dunne, Raby, 2004–present), and the Pompidou Centre in Paris (Dunne, Raby, 2005) [s3.4] and the Museum of Modern Art (MoMA) in New York included several critical designs in its 'Safe: Design Takes on Risk' exhibition (2006).

From 2006, with the restructuring of the department and its renaming as Design Interactions, the emphasis moved to the application of Critical Design to projects with academic and industrial research labs in different areas of science and technology, including synthetic biology, robotics and computing. In each area the focus was on using design to highlight social, cultural and ethical implications of the research being done in the labs. For example, Dunne and Raby's Technological Dreams Series, No. 1: Robots, a commission by Z33 for their 'Designing Critical Design' exhibition (2007), explored cultural and emotional consequences of cohabiting with robots. The EPSRC Impact! Project (2010) linked 16 RCA researchers with university research labs around the UK to explore the social, cultural and ethical implications of their research into areas including nuclear energy, quantum computing, synthetic biology and security [s3.5]. RCA researchers also experimented with how to present these ideas to various publics through curated exhibitions that introduced different audiences to Critical Design thinking's application to science research, e.g. The Science Gallery in Dublin (2009); The Wellcome Trust HQ Windows, London (2010); and the National Museum of China in Beijing (2011). Dunne and Raby also worked on framing the approach within a broad design context, in their book Speculative

Everything: Design, Fiction and Social Dreaming (2013) [s3.6].

3. References to the research

The outputs listed below have been through rigorous evaluation to ensure their high quality. In the case of s3.1 and s3.6, the publishers sent manuscripts for formal expert peer review; s3.2 and s3.5 were funded research projects that underwent peer review and were awarded funds in highly competitive circumstances (over £1million since 1997). Their delivery was monitored and reported according to the funders' criteria for research significance. Other outputs, such as s3.4, were the result of invitations from world-leading institutions that apply rigorous quality-selection procedures in their choice of exhibited designers; and s3.3 was profiled in publications of professional societies and presented at international conferences, e.g. DIS 2002. All URLs last accessed: 22/11/13.

3.1) Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design. Author: Anthony Dunne (CRD Research, 1999 and The MIT Press, 2006).

3.2) The Presence Project/Cultural Probes (1997–9). Project leaders: Anthony Dunne and Bill Gaver (CRD Research Studio). EU-Funded project. Book: The Presence Project (2001).

3.3) Placebo Project. Designers: Dunne and Raby (2001). Link to project: <http://www.dunneandraby.co.uk/content/projects/70/0>.

3.4) Evidence Dolls (2005) (RAE 2008). Designers: Dunne and Raby. Commissioned by the Pompidou Centre for the exhibition 'D.Day: Le Design Aujourd'hui', 29/6–17/10/05. Link to project: <http://bit.ly/WshTX2>; 'Evidence dolls', Catalogue essay in Nowhere/Now/Here, LABoral, Spain. Link to PDF: <http://bit.ly/110dU2H>.

3.5) EPSRC Impact (2010) (REF 2014). Researchers: Design Interactions Research. Project leaders: Anthony Dunne, Fiona Raby. Commissioned by the EPSRC and NESTA. Link to project: <http://bit.ly/ViutVq>.

3.6) Anthony Dunne and Fiona Raby, Speculative Everything: Design, Fiction and Social Dreaming (The MIT Press, 2013).

4. Details of the impact

Dunne's formulation of Critical Design contributes to the enrichment of cultural life and public discourse through exhibitions and exhibits exploring the social, cultural and ethical implications of emerging technology and science.

By moving 'upstream' in the cycle of design for manufacture and exploring ideas before they become products or even technologies, then translating them into fictional products, designers, industry, researchers and the public can explore, discuss and debate the possible consequences of technological applications before they happen. Dunne and colleagues use design to pose 'what if' questions about emerging technologies in order to explore what their impact might be on our everyday lives – both utopian and dystopian. They use design to help identify preferable futures rather than trying to predict the future, or ignore it. In this way, Critical Design provides new forms of expression for complex issues and grounds them in everyday situations that allow viewers to imagine how science research might affect their own lives, both positively and negatively.

Critical Design and cultural life

Critical Design research at the RCA as cited in Sections 2 and 3 has influenced the methods and ideas of design practice, through inclusion in major design exhibitions, professional

conferences, expert talks in companies, and coverage in the press, TV and film.

Critical Design has featured prominently in exhibitions aimed at increasing public understanding of design's interface with science and introducing new design ideas, methods and approaches to the public. For example, in 2008 MoMA dedicated a section of its seminal 'Design and the Elastic Mind' exhibition to Design for Debate, which included work by 21 RCA Faculty and former students. The exhibition was visited by 'over half a million people from all over the world' [s5.1: Senior Curator, Architecture and Design, MoMA]. Examples of Critical Design from Design Interactions researchers are in several key museum collections including those in MoMA, the Victoria & Albert Museum, and Frac Ile-de-France and Fnac (Fond national d'art contemporain) in France.

Through invited expert talks in, and collaboration with, companies, Critical Design has had substantial impact on attitudes to design's potential within research labs. 'The critical and speculative design traditions – pioneered and refined by Dunne and Raby … – have been used to shape a more sophisticated understanding of design and design research in our organisation. Most explicitly, this has contributed to a research competency in Microsoft Research, one that has sought to develop a nuanced view of what design and research can be in the technology industry and R&D. This has been borne out not just in individual studies and project work, but also reflected in our overall practice' [s5.2: Microsoft Research Cambridge].

Critical Design is now accepted globally as a valuable design approach by museums, professional designers, industry research labs and the media. Its impact on design practice and thinking is increasingly recognised beyond design, in mainstream press, including newspapers (e.g. Financial Times), television (e.g. the BBC's Culture Show; average 800,000 viewers) and film (Objectified) [s5.3].

Critical Design and public discourse

Critical Design research at the RCA has had a substantial impact on public discourse, by enhancing public understanding of major issues and challenges posed by science and technology for individuals and society, through exhibitions in major museums and inclusion in public museum collections.

For example, Dunne and Raby were invited by the Wellcome Trust to curate an exhibition, 'What if …' about design and science for their HQ Windows which ran from January 2010 to March 2011, and was seen by 'close to 2 million' passers-by, 'many of whom visibly stopped to find out more about the detail of the imaginative projects presented through this scheme' [s5.4: Head of Public Programmes, Wellcome Collection]. 'What if …' led to a commission by the Beijing International Design Triennial to curate an exhibition in the National Museum of China from 28/09/–17/10/11. This introduced a new way of thinking about design and technology to Chinese designers, curators, educators and the public and was visited by 800,000 people over three weeks.

In 2010, the EPSRC and Nesta commissioned researchers in the RCA Design Interactions Department to develop 16 design proposals that applied this approach to research projects supported by the EPSRC (RCA researchers James Auger, Onkar Kular, Nina Pope, Noam Toran). The research ranged from renewable energy devices and security technologies to the emerging fields of synthetic biology and quantum computing. The exhibition of the project at the RCA (15–21/03/10) was billed by the EPSRC as, 'offering a powerful insight into how today's research might transform our experience of the world'. For the EPSRC, 'The exhibition prompted a general debate on the impact of science which took place with a different audience to that which EPSRC usually reaches' [s5.5]. Approximately 1,300 people visited the exhibition, which was covered by The Guardian, Wired and Design Week, and selected work was exhibited

at MoMA (2011). It also served as a platform for exploring how design could affect science, specifically through a one-day event at Nesta where designers and scientists exchanged ideas about collaboration. 'As a direct result of such publicity [generated by the project] we have been approached by industry and academic partners to discuss collaboration opportunities' [s5.6: Professor of Computer Science, Aberystwyth University].

5. Sources to corroborate the impact

Copies of all sources to corroborate the impact are available from the HEI upon request. All URLs last accessed: 22/11/13.

5.1) Letter from the Senior Curator, Architecture and Design and Director, Research and Development, Museum of Modern Art, New York (dated 24/09/13).

5.2) Letter from Researcher, Socio-Digital Systems Group, Microsoft Research Cambridge (dated 10/09/2013).

5.3) Film: Objectified (2009) and TV programme The Culture Show, BBC Two (1 February 2013). Objectified: <http://www.imdb.com/title/tt1241325/>. The Culture Show: <http://www.bbc.co.uk/programmes/b01qgdj0>.

5.4) Letter from the Head of Public Programmes, Wellcome Collection (dated 27/09/13).

5.5) Letter from Communications Manager, EPSRC (dated 22/11/13).

5.6) Letter from Professor of Computer Science, Aberystwyth University (13/09/13).