Institution: Falmouth University

Unit of Assessment: 34 - Art and Design: History, Practice and Theory

Title of case study: Autonomatic: the integration of digital technologies in the UK Craft and Designer-Maker sector

1. Summary of the impact

This case study describes the impact of research undertaken by Falmouth's Autonomatic Research Group on developments in the UK Craft and Designer-Maker sector. This sector consists of individual or small groups of creative practitioners producing high value individual and bespoke products in studio/workshop environments using ceramic, glass, metals, textile and mixed media. This sector has been slow to benefit from the digital economy for reasons including cost, perceptions of relevance, accessibility and training. Autonomatic has worked to highlight digital technologies relevance to small scale and bespoke manufacturing, increase accessibility, and provide opportunities for businesses' and communities' creative development.

2. Underpinning research

Autonomatic is a group of practitioner-researchers focused on developing specialist digital craft skills; their research is driven by the interests and needs of the UK Craft and Designer-Maker sector, and highlights the importance of specialist, high quality, small-scale production within the wider Digital Economy to bridge C20th craft practices and the C21st manufacturing revolution (Bunnell & Marshall 2009).

The research team relevant to this impact case study is: Dr. Katie Bunnell, Dr. Justin Marshall, Mr. Drummond Masterton and Mr. Tavs Jorgensen.

Autonomatic research creatively uses digital design, data capture, digital production and digital network technologies to pioneer design production processes and new aesthetic qualities. This experimental approach to technology emphasises risk-taking as the genesis of innovation. Research has explored the technological potential for makers to develop more environmentally and economically sustainable methods for scaling and adapting production to demand. (Bunnell, 2004). Practice-based research has been concerned with developing direct control of typically automated Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) processes, deconstructing standardised tools to create unique qualities. Autonomatic's work has led to situating interrogations of the relationships between CAD and CAM as intrinsic to the development of its craft products. The development of a dialogue between CAD code and CNC tooling has enabled the realisation of complexity and highly individualised design qualities (Masterton, 2007). Research by Jorgensen has extended this dialogue in relation to the development of expressive, gestural and intuitive methods of gathering design data than those offered by standard CAD toolsets and digital data capture devices (Jorgensen, 2007).

Recent projects have been collaborative in nature, working with computer programmers to explore the role of the maker in developing user-friendly online interfaces that enable public engagement with designing and making bespoke products. Since 2006 Autonomatic has developed international collaborative projects with computer programmers, Human Computer Interface Designers, technologists, artists and makers exploring digital design, production and network technologies (Bunnell, 2010, Marshall, 2011). Autonomatic's work has resulted in innovative, networked business models for crafts practitioners which contribute to digital economy (Bunnell & Marshall, 2009) Autonomatic's 'Supercrafted' project, part-funded by BT Superfast Cornwall Labs and ERDF, is exploring the innovative applications of superfast broadband for craft practitioners in remote locations such as Cornwall. This year Autonomatic established Makernow, Falmouth University's centre for digital making: a resource open to all users and internationally connected via the global FabLabs network.

3. References to the research

Marshall, J., Wallace, J., Wood, G., Thomas, J,. Blum-Ross, A,. Olivier, P.(2013) ***The value of Craft characteristics in interdisciplinary design development teams***, Crafting the Future, 10th European Academy of Design Conference, Gothenburg.

Atkinson, P., Marshall, J., Unver, E. & Dean, LT (2011**) I Did it My Way: User engagement in Post Industrial Manufacturing**, Proceedings of SIM2011: Sustainable Intelligent Manufacturing, Leiria pp 679-687, IST Press, ISBN 978-989-8481-03-0

Bunnell, K. (2010) **1497 Plates: Crafting Collaboration***,* in the proceedings of Design and Craft: a history of convergences and divergences, 7th Conference of the International Committee of Design History and Design Studies, 20-22 Sept 2010, pp 458-462

Bunnell, K., Marshall, J. (2009) **Developments in post industrial manufacturing systems and the implications for craft and sustainability**, Making Futures: the crafts in the context of emerging global sustainability agendas', Plymouth College of Art & Design, 'Making Futures' Vol.1.ISSN 2042-1664. **http://makingfutures.plymouthart.ac.uk/journalvol1/papers.php** This paper was also published as a chapter in 'Fabvolution: Developments in Digital Fabrication', 2012, Disney Hub Barcelona, ISBN 978-84-9850-391-3

Jorgensen, T. (2007) **Conducting Form**, Design Enquiries Conference, Stockholm, Sweden, May 2007

Masterton, D. (2007) **Deconstructing the digital**, a paper presented at the New Craft Future Voices Conference, Duncan of Jordanstone College of Art and Design, Dundee, 2007. Full paper available in the published proceedings, ISBN 1 899837 55 8.

Bunnell K. (2004) **Craft and Technology**, key note speech for the World Crafts Council 40th Annual Conference, Metsovo Greece.

4. Details of the impact

Autonomatic research has featured in international public exhibitions and lectures, won significant national awards and prizes and influenced policy in the craft sector over the last 10 years. In 2013 Autonomatic was presented the Craft Skills Spotlight Award, recognising important work done in digital skills across the sector.

Business Development - researchers have engaged in knowledge transfer and exchange activities with the professional sector through workshops, collaborative projects, exhibitions, demonstrations and public lectures. Autonomatic aims to demystify digital tools, promoting technological experimentation and risk-taking as the basis of creative business development. In 2006, Autonomatic worked with Hidden Art Cornwall, a membership organisation supporting Designer-Makers in Cornwall, to deliver 'Repeat and Variation', a project providing members with an opportunity to develop new products through their exploration of digital technologies. Hidden Art Cornwall's membership was invited to a networking event on designer-makers' creative applications of digital technologies and a digital technology demo day. 50 members attended the networking event and 25 the demo. 10 Members submitted ideas for the creative use of technologies in their own practices and 5 proposals were selected for development with the Autonomatic team. Working closely with researchers, makers developed digital production processes and innovative products, subsequently exhibited at the Hidden Art Cornwall Design Fair at Godolphin House, Cornwall, 2006. (www.autonomatic.org.uk/rv_intro.php). This project influenced business development for two participants in particular:

Lucy Turner developed a new business laser cutting inlays for surface decoration on furniture. Her work now retails in John Lewis. In June 2013, 7 years after 'Repeat and Variation,' Turner comments on Autonomatic's impact on her business: 'I knew what I wanted to do but my lack of experience with digital design tools was holding me back. I can't thank Katie and Justin enough for sharing their expertise with me and helping me see an idea through from start to finish, giving me a launch pad for the beginning of a now successful business."

Jethro Macey used digital tools for prototyping and mould-making for his 2007 Elle Decoration Award-winning tiles. Autonomatic's technological instruction and processes enabled him to easily scale up and outsource production to a manufacturer when demand increased. In June 2013, Macey: 'Working with Autonomatic through the Repeat and Variation project radically changed the way I viewed the use of digital technologies … They bridged the communication and understanding

gap that is often found when designers work with digital manufacturers that are often engineering based and aren't as open to experimentation. Working with people that understood the aesthetic, conceptual and technical processes in an integral way enabled me to experiment and come up with a product that kick started my career. From my initial concept I realised a successful project that went on to be awarded an Elle Decoration British Design Award and shaped the future of my business.'

Crafts Sector Policy - Bunnell and Marshall's Autochina and Automake projects are included in Craft's Council reports and policy documents as examples of innovative business models for craft practitioners (a list of policy documents is provided in the following section). This work forms the basis of a current research project at Falmouth. The 'Supercrafted' project, part-funded by BT's Superfast Cornwall Labs and ERDF, is developing digital technology applications that facilitate online digital design, manufacture or marketing interaction.'Supercrafted' experiments and directly engages with Internet support of craft communities (http://www.falmouth.ac.uk/content/supercrafted). Dr Ranulf Scarbrough, Director - Cornwall Superfast Broadband Programme at BT: 'Autonomatic's work with the Craft sector in remote locations such as Cornwall is enabling new engagement with digital network capabilities for micro business, exploring the potential of technology to transform their market reach. Their work is influencing the development of new business models for small scale high quality networked manufacturing in the digital economy'.

Public Art Impact - '1497 Plates': A collaborative project with artist, Chris Tipping, to produce a 9m x 6m wall of digitally-designed and manufactured bone china dinner plates commemorating Combe Down Stone Mine, commissioned by Bath and North East Somerset Council and exhibited at the Octagon, Bath, 2010. The plates were digitally designed by Bunnell and Tipping and manufactured by Digital Ceramic Systems in Stoke-on-Trent. Combing digital data from engineers, geologists and Ordinance Survey with archaeological references and cultural associations, the plates record the mine's impact. After the exhibition, individual plates recording houses were gifted to the house owners and the rest were made into sets auctioned to the villagers.

5. Sources to corroborate the impact

2013 Craft Skills Spotlight Award in recognition of important work in digital skills across the sector awarded to Autonomatic for the way in which they use digital skills and techniques in the process of craft-making. Awarded by Creative and Cultural Skills, UK and presented by HRH Prince Charles at Glaziers Hall London.
http://ccskills.org.uk/craftskillsawards/news-and-events-detail/craft-skills-awards-winners-announced

Dr Karen Yair, Independent researcher, writer, research manager and strategist (contact details given separately), endorsement for Autonomatic's Craft Skills Award 2013:
'Autonomatic … has established University College Falmouth as one of the UK's few centres of excellence in this emerging discipline, inspiring a new generation of makers to take craft forward into the digital age.
Autonomatic is a creative hub of students and internationally acclaimed practitioners, all using craft techniques, skills and methodologies to address real-world challenges around technology, wellbeing and economic & community development. Its successes and ambitions deserve full recognition, both within and beyond the creative industries.'

Drummond Masterton , 2008 Jerwood Contemporary Makers
Jerwood Contemporary Makers was launched in 2008 as a three year exhibition series supporting and showcasing emerging practice in the field of making and is the UK's only award for the applied arts. A different panel of selectors curates the exhibition annually, inviting makers to respond to a different guiding concept.
http://www.jerwoodvisualarts.org/3512/Jerwood-Contemporary-Makers-2008/245

Public exhibitions
Lab Craft: Digital Adventures in Contemporary Craft, Crafts Council UK touring show highlighted the most innovative developments in UK digital craft and included work by Justin Marshall, Tavs Jorgensen and Drummond Masterton as well as two other members of the Autonomatic group not submitted in the REF: Gary Allson, Senior Lecturer in 3D Design at Falmouth University and Associate Researcher and textile artist Ismini Samanidou.
http://www.labcraft.org.uk/
http://www.guardian.co.uk/lifeandstyle/gallery/2010/nov/01/lab-craft-max-fraser
Tavs Jorgensen (2010) ***One Liner****,* Crafts Council, UK, web feature solo show of digital craft work, http://onviewonline.craftscouncil.org.uk/one-liner/

Public collections
Drummond Masterton: Ironbridge Gorge Museum, Telford, 2013, Dundee University Collection, Dundee, 2013, Shipley Art Gallery, Gateshead, 2012, Manchester Metropolitan University Special Collection, Manchester, 2012, Crafts Council, London, 2011, National Museum of Scotland, Edinburgh, 2009, Houses of Parliament Metalwork Collection, London, 2004

Tavs Jorgensen: Crafts Council, London 2013

Katie Bunnell: Manchester Metropolitan University Special Collection, Manchester 2012

Business Development
Lucy Turner
http://www.johnlewis.com/john-lewis-lucy-turner-leaf-limited-edition-nest-tables-set-of-2/p384925
http://www.lucyturner.co/,

Jethro Macey is prepared to corroborate this case study (contact details given separately), http://www.falmouth.ac.uk/content/falmouth-3d-designer-wins-elle-decoration-british-design-award. http://www.jethromacey.co.uk,

Policy
Crafting Capital: New Technologies, New Economies, Crafts Council Report, 2011 mentions Katie Bunnell's Autochina Project in the section on Digital and Communications Technology
http://www.craftscouncil.org.uk/about-us/press-room/view/2011/crafting-capital?from=/about-us/press-room/

Schwarz, M & Yair, K (2010) **Making Value: Craft and the economic and social contribution of makers**, Crafts Council ISBN-10 1903713226 see page 40 and page 110 and Bibliography references papers from members of the research group
http://www.craftscouncil.org.uk/files/file/7cec2fd1e3bdbe39/making_value_full_report.pdf

Ed Vaizey, MP, Minister for Culture, Communications and the Creative Industries mentioned Bunnell's Autochina project in his keynote address at Assemble, The Crafts Council's Annual Conference, 2012. See c. 9 minutes into this film:
http://www.assemble.org.uk/programme/keynote-presentation-ed-vaizey

The Craft Blueprint: A workforce development plan for craft in the UK**,** June 2009, Creative and Cultural Skills.
http://creative-blueprint.co.uk/search/results/a8977a47a3551b2b6b212411404fa96e

Ranulph Scaborough, Director Cornwall Superfast Broadband Programme at BT (contact details given separately) has offered to corroborate the impact of this case study on the development of micro craft businesses in Cornwall