

in this  
place

# in this place: cumulus association biannual international conference

Conference proceedings

Wednesday 27 April - Sunday 1 May 2016

Hosted by the School of Art & Design  
Nottingham Trent University  
Nottingham, UK





---

**In this Place: Cumulus Association  
Biannual International Conference**

**Conference proceedings**  
**Wednesday 27 April - Sunday 1 May 2016**

**Edited by Professor Duncan Higgins and Professor Venu Dhupa**

---

Published by: Nottingham Trent University: CADBE  
Burton Street, Nottingham NG1 4BU  
Copyright 2016 Nottingham Trent University  
2016  
ISBN 978-0-9928878-1-0

# contents

INTRODUCTION FROM NOTTINGHAM TRENT UNIVERSITY	PAGE 06
OPENING PROCEEDINGS	PAGE 08
-Welcome from Luisa Collina, President of Cumulus	
-Contribution from Kathy McArdle, CEO, Creative Quarter, Nottingham	
-Contribution from Dr Daniel Glaser, Director, Science Gallery, London	
-Contribution from Wolfgang Buttress (Artist) – The Hive, with Martin Bencsik (Physicist), Nottingham Trent University	
-Contribution from John Mathers, Design Council, UK	
-Presentation of India's Cumulus Ambassadors	
CALL FOR PAPERS AND SELECTION PROCEDURE	PAGE 15
CONFERENCE PAPERS	
ACADEMIC AND PROFESSIONAL STRANDS	
Negotiating Artefacts	PAGE 18
Innovation	PAGE 58
Future Craft	PAGE 104
Future Space	PAGE 181
Sustainability	PAGE 248
THE PLENARY	PAGE 290
STUDENT STRANDS	
Negotiating Artefacts and Future Craft	PAGE 291
Innovation and Sustainability	PAGE 322
Future Space	PAGE 361
CHAIRS COMMENTS AND WINNING PAPERS	PAGE 403
ABSTRACTS	PAGE 405
FULL CONFERENCE TIMETABLE	PAGE 440
REVIEW OF IN THIS PLACE BY ANNE BONNAR	PAGE 442
REVIEW COMMITTEE AND ACADEMIC STRAND CHAIRS	PAGE 446
PEER REVIEWERS	PAGE 452
LOOKING FORWARD	PAGE 459

# introduction from nottingham trent university

## IN THIS PLACE



Professor Duncan Higgins, Conference Chair,  
Nottingham Trent University



Julie Pinches, Dean, School of Art & Design,  
Nottingham Trent University

On behalf of all the staff and students at Nottingham Trent University (NTU), our conference partners in the city of Nottingham and Cumulus we want to take this opportunity to thank all those who took part in the conference 'In this Place' and for making it such an imaginative and thought provoking event. In particular we would like to take this opportunity to thank Tracey Newton, Sarah Connor, Sarah Dossor and Venu Dhupa from NTU for their creative input, making the conference and this subsequent publication such a success. Our sincere thanks to them.

So to the title and questions for the conference and this publication

***'In this Place'***

## ■ What are the questions, choices and conversations we need to have as we create the future we are becoming?

There is much commentary that suggests that the people, actions and objects that inhabit a place, pass through it or the choices we make in it, define a place. Hence a place is not fixed by any one definition; it is under constant negotiation and must also be seen in relation to the situation of conflict in both a positive and negative sense. Survival and conflict in places is such a reality today and affects so many people, their choices, actions, voices and subsequently the precarious futures of places. What are the questions, choices and conversations we need to have as we create the future we are becoming?

The conference and publication asks how a shift is taking place from art and design being seen or defined as a 'service' and is increasingly now embracing socially engaged practices. This is critically framed in response to an understanding of our ability to produce and consume images and objects via a 'market economy', or to be more accurate the product of neoliberalism. There has been a lot of critical debate regarding a situation of 'exhaustion in capital'.....  
...we produce more than we can consume and the by-product of the

production has led to unimaginable impact on our environment, coupled with the impact of social and material displacement. This of course is not design or arts fault, yet here we are with potential choices as we create and form a future creative culture. For example, in the UK we are now responding to the very

differences between art and design – practically, emotionally, conceptually and employability. It goes something like this... ...Design seems to want to solve problems, create solutions and answer questions. Art seems to want to ask questions, create problems and unfix solutions that seem fixed. Of course it is not that simplistic and perhaps now these divisions or territorial disputes are no longer of any use. Hence, the conference and publication brings together a wide range of artist, designers, academics, professionals and students.

'In this Place' sets out a desire and ambition to listen to others and be heard by others, as the essential route of knowledge exchange and intercultural dialogue. That this is a 'doing thing' rather than an 'owning thing', where uncertainty and not knowing become creative principles of discovery. Consequently, it is the creation of new opportunities to see and to listen beyond what is known, that has the potential to lead to the creation of new knowledge both personally and culturally. For NTU to be a place for creative knowledge exchange is our firm belief and understanding of the fundamental role of universities and art schools to host, facilitate, frame and enable exchange.



pressing question facing our future relationship and membership with the EU and the impact this creates.

With some of these things in mind, 'In this Place' raises an essential platform for us to discuss, inform, share and direct critical questions that can or should be asked. It has been said many times that in a school of art and design there are distinct

# conference papers

## academic and professional strands

### FUTURE CRAFT

CHAINED BY PROFESSOR TOM FISHER

---

Digital making as an opportunity for skilling and empowerment *G. Salvia, C. Bruno and M. Canina*

---

Maker movement – creating knowledge through basic intention *T. Dufva*

---

Codesigning and sustainable practices in fashion teaching *D.P. Cuenga and P. Baldan*

---

There is far too little handicraft going on at the university *L. Håkanson*

---

Connecting with local resource flows – flax fibre composites *F. Kane*

---

The potential of rural crafts in promoting community empowerment through participatory design intervention *B. Wang, T. Ji and Y. Yang*

---

Personal imagination and collective identification – Chinese implication of handmade design *Y. Li and L. Zhang*

---

Strategic design – innovation tool for social entrepreneurship *D. Montt*

---

Circular interdependency: a mindful design investigation into a natural living system *G. van Melle*

---

The role of craft in creative innovation, skin, cloth and metal *K. Townsend and K. Niedderer*

# digitally making as an opportunity for skilling and empowerment

## AUTHORS:

Giuseppe Salvia  
Politecnico di Milano (Italy)

Carmen Bruno  
Politecnico di Milano (Italy)

Marita Canina  
Politecnico di Milano (Italy)

### Abstract

The current trend of digitally enabled self-production (i.e. digital DIY) is emblematic of the contemporary attitude to making and crafting. Although digital DIY has been seen as an opportunity for social and technological innovation, a major debate is taking place in research literature about its potential skilling or deskilling effect on practitioners.

For instance, on the one hand, focusing on the digital representation undermines the ability to experience materials qualities and manufacturability. The ultimate effect is the development of a creative process, which is led by a virtual idea disconnected from the material world. On the other hand, the machine itself is a manifestation of knowledge, skills and labour involved in its design, manufacture and maintenance.

The objective of this paper is to further unpack this debate and presenting our reflections from an ongoing research project on the potential of digital DIY as a skilling process through making collaboratively. We introduce a research model representing the dynamics enacting over three interdependent levels (i.e. social innovation, social practice and creative process) in which three factors of technology (e.g. digital fabrication), motivation (e.g. commitment) and collaboration (e.g. with peers) are envisaged as crucial for learning and skilling.

**Keywords:** digital Do-It-Yourself (DIY), making, skills, design

# digitally making as an opportunity for skilling and empowerment

## 1. Introduction: the digital self-production trend

The current trend of self-production (i.e. Do-It-Yourself or DIY) is emblematic of the contemporary widespread interest to crafting and making, applied to a wide range of products, from knitwear and clothing (e.g. wearables), to furniture and electronic devices (e.g. Arduino), and even houses and more complex infrastructure items (e.g. solar panels). This contemporary DIY appears to embed a potential of technological and social innovation by many so that the envisaged impact is the initiation of “the new DIY age” (Hoftijzer 2009), a new industrial revolution (Anderson 2012) and even a “paradigm shift” (Fox 2013). The collaborative nature characterises the contemporary evolution of self-production moving away from the more individualistic conventional DIY of the past century. This collaborative evolution has been enabled especially by digital technologies connecting people on a global scale (e.g. Internet 2.0) and bringing production closer to consumption (e.g. digital fabrication and distributed systems), thus making this an ongoing social innovation phenomenon in which people reinvent their ways of living (Manzini 2015).

A recent research project by Nesta mapped major European organisations and activities for ‘digital social innovation’, intended as: “a type of social and collaborative innovation in which innovators, users and communities collaborate using digital technologies to co-create knowledge and solutions for a wide range of social needs and at a scale that was unimaginable before the rise of the Internet.” (Bria 2014, p.i) They consider social innovation “in relation to the initiatives that are based on ‘meaningful discontinuities’ in the way involved participants behave and interact collaboratively leveraging the power of collective intelligence through open digital technologies.” (Bria 2014, p. 5)

The potential of social innovation embedded in the new DIY age is related – at least in part – to these interactions between makers who will support each other for the accomplishment of goals, also known as ‘commons-based peer production’ (Benkler & Nissenbaum 2006). In the realm of crafting and making, significant outcomes of the digital DIY trend include platforms not only for designing (and sometimes producing) collaboratively parts and products but also for sharing knowledge and competences typically related to the use of digital fabrication technologies and infrastructures (e.g. 3D printers and laser cutters).

### The debate: skilling or deskilling?

The current self-production trend represents therefore an opportunity for fostering social innovation especially by sharing and developing a new set of digitally-based skills. Furthermore, crafting and making involve the development of cognitive and manual skills, including creativity and the ability to produce ideas, problem-solving, critical thinking, and collaboration, which are considered key players for the next century citizens, students and workers (The European Parliament and the Council of the European Union 2006; Partnership for 21st Century Skills 2008).

However, the overall effect of the digital evolution of this making practice on individual skills and empowerment is still debated. In fact, the spreading of digital fabrication raises arguments on its potentially skilling or even deskilling effect on people (Hielscher & Smith 2014). “On the one hand, these technologies are said to encourage passive consumers to engage in creative making process in their spare time without having to pick up years of craft learning – reskilling, whilst on the other, they are said to automate making processes previously requiring craft skill – deskilling.” (Ree 2011, p. 34)

Further research is needed to shed light on the technical, cognitive and social skills mainly involved in this practice, which may contribute to fundamental questions such as how the digital-fabrication technology influences the acquisition of new skills. This debate is quite well-known in the STS field, with the emblematic Braverman’s theory of deskilling through technology advances and automation. More recently, Söderberg (2013) reconsiders this theory, in particular in relation to capitalistic system, in which automation could represent a means to weaken unions and workers’ strength. The argument is based on the dispute around such deskilling theory and related works in STS field. This is then related to the contemporary debate about the deskilling risk of 3D printers through the case of the RepRap and its comparison with the history of CNC machines.

This topic in literature has been more oriented to consider the effects on organisation of labour and ultimately on workers’ empowerment but the arguments on the consequences of automation may be relevant for a better understanding of the effects of digital means of production on skills development.

The history of major technological upheavals is characterised by different response to technology, as summarised by Dello (2015) (see figure below), ranging from the Luddite proposal of machine destruction to safeguard workers to the intention of owning the means of production as a means of emancipation for the hacker movement. However, these movements somehow failed in their actions for different reasons, such as the absorption of

the hacker movement in the consumption realm (Dellot 2015). The awareness of these past failures could be the starting point for planning interventions in the current maker movement in order to catalyse its potential, especially in terms of skilling and self-reliance in this paper, thus avoiding to miss another opportunity for positive societal change. In fact, according to a recent investigation carried out by RSA (Dellot 2015) participating to makerspaces increases the potential for people to generate three main benefits, which are fulfilment, learning, and enterprise.

The debate is relevant for design research as well. Making is creating and as so it requires adequate skills for the development of creativity. The creative elements in DIY enhance people's notion of themselves as agents of design rather than merely passive consumers (Atkinson, 2006). It is plausible that the level of attitude, experience and skills in delivery creative ideas and managing the creative process affect the way in which the digital DIY practice is carried out and the output is generated.

From a design research perspective, it will be relevant to understand how the creative process may change when addressed collaboratively, or the difficulties encountered by digital DIYers when developing the creative process in order to identify potential areas of intervention for designers aiming at supporting them.

### Objective of the paper

This paper draws on arguments from the debate on the skilling and deskilling potential of digital making, based on the preliminary reflections of the authors in an ongoing research project about design interventions fostering the acquisition and development of skills through digital DIY practice.

The debate is possibly nurtured by the challenges involved in the definition and measurement of skills, which vary according to discipline and purpose. For instance, Attewell (1990) groups these approaches in four sociological notions of skill (positivistivc, ethnmethodological, Weberian, and Marxist) and points out the criticism towards the attempts of quantifying variations of skills – over time or across people – as they risk to be too simplistic unreliable.

Delving into the discussion of definition is out of scope for this paper and, at least provisionally, we consider skill as the cognitive, physical and social ability of doing something, independently from the level of proficiency. However, unpacking definition and – whenever possible also measurement – of skills is already planned for the next steps of our research, with a focus on the key competences (The European Parliament and the Council of the European Union 2006).

In the next two sections of this paper, the arguments found in literature on the two extremes of skilling and deskilling potential in digital DIY is addressed with regard to two main groups of skills, which are cognitive and body, and social skills respectively. It is here anticipated that at this stage of the research, a higher potential for skilling, rather than risk for deskilling, results from literature. The paper concludes with the proposal of a model for mapping the dynamics of skills development.

## 2. Debate on cognitive and body skills development

Technological advances reshape the way people think, speak and perceive reality, thus implying transformations on culture and society. The use and development of digital devices requires the acquisition on at least fundamental knowledge in informatics and electronics. This also implies sometimes a more unstructured approach to tasks and daily life. The use of digital media has cognitive implication on the human brain and according to some theories this undermines the ability of reading deeply, the semantic comprehension of a piece of text or the deep emotional involvement, thus provoking a form of apathy (Cortoni 2015). On the other hand, digital media may foster the development of problem solving and information analysis skills. Furthermore, implications on the development of a creative process through a more 'agile thinking' enabled by the use of digital media are expected.

The main typologies of cognitive skills involved in this process of digitally enabled transformation identified in literature regard the balance between virtual and material worlds and the awareness and appropriation, summarised below.

### Virtual representation vs material experience

One of the main arguments on the deskilling effect of digital DIY refers to the fundamentally virtual nature of the practice through production machines such as 3D printers, CNC mills and laser cutters. The digital DIYer is often involved in the use or development of a virtual object and eventually automated machines will produce this or its components to be assembled.

**Figure 1: Four movements championing making. Source: Dellot, 2015**

Phase	Response	Driver	Leaders	Outline
Justine movement	Create the tech	Introduction of their automated machines	Wobots	Relied on violence and follow the recognition benefit of new tech
Art and craft movement	Ignor the tech	Craft of mass production	Industrialists	Resisted digitizing technologies and used hand-based appeal
Hacker movement	Over the tech	Introduction of computing and the internet	Tech enthusiasts	Loose emphasis on hacking and championed consumption over production
Maker movement	Embrace the tech	Technological ubiquity	Leaders	?

Focusing on the virtual representation of the object undermines the ability for the practitioner to experience materials qualities (e.g. hardness) and manufacturability (e.g. lathing, melting), and to learn through hand making, thus flattening the three-dimensional knowledge of hand making to the bi-dimensional realm. The ultimate effect could be the development of a creative process, which is led by a virtual representation of reality disconnected from the material world. The potential consequences of such deskilling effect include inefficient and ineffective ways of producing due to a lack of knowledge of materials features.

Digital DIYers risk to overly rely on technology thus undermining the exploratory manual approach, which may turn out useful when attempting to repair or restore. Less repairing ability (maybe also due to lower manual skills in repairing machineries) and as a consequence disempowerment.

As a response to such arguments, Ree (2011) has claimed that although digital tools turn much of the in-situ effort of materialisation over to a machine, the machine itself is a manifestation of knowledge, skills and labour involved in its design, manufacture and maintenance. Moreover, he has tried to argue that there is an element of improvisation and experimentation within the digital fabrication making process. Once the object is created it can be held and studied and therefore altered (often there is the need to finish off the digitally fabricated objects through handwork) (Ree 2011).

Boza (2006) summarises the reflections from a hybrid making-based experience with students, in which manual tasks were integrated with CNC operations. The final goal is demonstrating the complementarity of these two different ways of working, especially when the innovation brought by technology may risk to obscure the quality of hand-crafting. The author refers to the work by Pye, in 1968, who called handcrafting as the “workmanship of risk” and machines as “workmanship of certainty”, the reason is self-explanatory.

Students were asked to create plywood panels, perforated with CNC milling machines and adjusted with manual tasks (such as preparing, sanding, carving). The author concludes pointing out that “for the student the result was a comprehensive understanding of their design proposal, of the materials employed, and of the methodologies/techniques necessary for the two to coalesce into one”. The final reflection is that “while craft relies on a predefined yet intuitive process technology can become the catalyst for humanising opportunities to occur rather than an end to the means” (Boza 2006, p. 7).

Furthermore, digital fabrication technologies need to be set according to the materials used. Therefore, the use of such machines will require knowledge on material qualities which possibly were not so fundamental for non-digital DIYers. For instance, melting point – particularly relevant for plastics to be 3D printed – can be considered of secondary importance for common people, moving the level of knowledge from more a macro to micro level, from properties enacting on a more visible level to the ones determining micro-level properties.

### **Awareness, appropriation and learning**

The digital DIY is subject to the risk of overemphasising the role of technology over human abilities, focusing on what technology can do and neglecting the potential for human involvement. For instance, many things can be made more easily or efficiently by hand rather than by machine.

Dellot (2015, p. 14) believes that “[t]he maker movement helps people gain mastery over technology in two senses [...] it is concerned with enabling people to use technology to produce something useful [...] This is important for self-reliance. But the movement is also about helping people to understand technology, by which we mean becoming aware of how it works and what it is capable of. Through novel acts of making we come to understand the workings of tools and the make-up of objects. This gives us a sense of agency but also a greater awareness of technology’s externalities, for example on sustainability and matters of privacy.”

This awareness allows for the transfer of competences from one field to another, typically with notions of informatics and electronics, which may be useful also for increasing the confidence in maintenance and repair of technologic devices.

According to Ackermann (2013, p. 4), contemporary DIYers “make do with what they have (bricolage) in order to make theirs what they care for (appropriation)!” as a reaction to increased level of commodification. The author defines ‘appropriation’ as “the process by which a person or group becomes acquainted with, and gains interest in, things by making them their own”, typically through a mere process of adoption of a given technology, reinterpretation of an artefact to fit individual needs or pushing its design capabilities.

Making also fosters knowledge acquisition and learning. In her book chapter, Schrlhowe (in Walter-Herrmann & Büching 2013) aims at highlighting the opportunity provided by FabLabs as learning environments, on the constructionism oriented basis that making is an effective means for constructing knowledge. This hypothesis is based on five factors identified in FabLabs, which are:

1. combining physical activity and abstract thinking, which is typical when using the fabrication technologies available in FabLabs
2. revealing the model behind the scene, i.e. an environment which displays how things are made thus facilitating the opportunity for better understanding production and customisation processes

3. initiating processes of reinventing and refining ideas and products, fostered by the plethora of tools available in FabLabs and namely through a trial and error approach which could encourage imagination and reinventing.
4. relating to post-modern society's conditions, closely related to the acquisition of key competences
5. social and community learning, embedded in a participatory culture.

As pointed out by Cortoni (2015) on the use of digital media from an educational perspective, the possibility to acquire or lose cognitive skills depends on frequency and intensity of their use and, referring to the work by Rheingold, the consolidation of possibly fleeting input from digital media can be regulated, taught and practiced.

### **3. Debate on social skills development**

Literature on digital making tends to converge towards the positive impact of this practice in fostering social relationship. The digital making trend is fundamentally a phenomenon of social innovation (Manzini 2015) gathering people with different levels of skills and interest around a common project. Digital DIYers collaborate thanks to the development of tools and platforms, which facilitate dialogue and participatory work. The Web 2.0, wiki platforms, makerspaces, hackerspaces allow both digital and physical interaction between people committed to develop a project collaboratively. As pointed out by Dellot (2015, see figure 1) this is a leaderless movement in which participants are equally invited to join and contribute according to their possibilities and interest. The result is a resilient network of knowledge and competence, or also of 'Collective intelligence' which Nesta defines as: "[a] kind of ability to solve problems in distributed fashion so that the entire system is self-maintaining in the face of often unpredictable problems." (Bria 2014, p. 14)

The collaborative approach in digital making requires – or at least encourages – the ability of working in teams, dialoguing for reciprocal understanding. According to Mellis (2014, p. 28) "DIY electronic devices let individuals express many different skills and interests. These can complement each other, allowing for various forms of collaboration between people with different kinds or levels of expertise and interest in the process. Furthermore, these involvements offer different possible outcomes, whether production of useful devices, learning about technology, or social activities."

In the discussion of their analysis of the literature on the social nature of makerspaces, Hielscher and Smith (2014) also consider creativity as an opportunity for empowerment and democratised innovation. For them, open questions in this area include how material capabilities and skills are linked to the wider social and political ambitions, which level of skills are needed to be part of such a revolution, how far this making process can be framed as a political or social activism form.

Digital making is not necessarily an inclusive practice as yet. Although the movement and the trend encourages wide participation, members of makerspaces for instance – in which collaborative digitally enabled production takes place – are remarkably unbalanced in terms of age and gender (Hielscher & Smith 2014). Possibly, such a practice or place is not so appealing for everyone yet, especially older and female people. Considerable efforts are still required to make the movement an actually inclusive one, thus maximising the opportunity of developing collaborative skills with a wider variety of people and contexts.

### **4. Conclusions and future developments**

These preliminary reflections on digital making sustain the hypothesis that the balance between the skilling and deskilling is not fixed but margins for developing cognitive, body and social abilities are evident if properly fostered. Digital fabrication technologies may be seen as an appealing opportunity of being involved in creative processes for less engaged DIYers who are let down by the often long lapses of time required to acquire manual skills of the traditional non-digital DIY. As Watson and Shove inferred from a study about craft consumption (2008, p. 80), such machines are "not instruments of de-skilling and dumbing down but as agents that rearrange the distribution of competence within the entire network of entities that must be integrated to accomplish the job in hand. By implication, efforts to understand the dynamics of what people do – for example how the boundary shifts between situations in which people employ a professional or in which they do the work themselves – should therefore focus on the co-evolution of these hybrid entities rather than on the human or non-human elements alone."

Although we are aware that the debate could benefit from an even wider framework including political context and power relations (Söderberg 2013), drawing on the arguments above we envisage the potential for digital DIY practice to foster the development of creative skills, as the material set (e.g. technologies) opens up the range of things still to be made thus stimulating the creativity of people, which may be amplified through a collaborative approach. Tools fostering creativity during the creative process may limit the deskilling chances for digital DIYers, namely supporting with the identification of the most effective material to be used.

The EU funded project 'Digital Do-It-Yourself (DiDIY)' ([www.didiy.eu](http://www.didiy.eu)) aims at developing a human-centric and multi-perspective approach to the scientific study of current self-production trend enabled by digital fabrication, in order to better understand its impacts on all areas of society and to support both education and policy making on Digital DIY, through models and guidelines driven by social and cultural strategies.

In particular, we – as partners of the DiDIY project – are going to explore the dynamics facilitating the acquisition of skills and 21st competences in this practice. As design researchers, we aim at contributing by developing (co)design-driven tools facilitating the identification of the skilling dynamics in place where digital DIY practice takes place and explore models for including them in working and educational environments.

Understanding the dynamics for the acquisition and development of the above skills is our core intent. We hypothesise that skilling processes in digital DIY take place through the interplay of main factors enacting on different levels, which include digital DIY as a:

1. phenomenon of social innovation in which collaboration and sharing take place
2. practice carried out by the individual using tangible means, attributing meanings and enacting competences
3. creative process, developed through cognitive tasks.

Three are the factors, which we believe influence the skilling process across the three levels above, i.e.:

- a. digital technology, both facilitating collaboration and access to tools
- b. motivation, as commitment to participate and self-organisation
- c. collaboration, both with peers and with facilitators.

The resulting model will be verified through fieldwork activities over the following months, namely through direct observations and interviews in the places where digital DIY is carried out. The verification of such dynamics involving often-tacit skills appear challenging. To this purpose, we anticipate the potential of using tools eliciting the manifestation of skills borrowed from design thinking and co-design. These design approaches aim at investigating and clarifying processes of ideas generation and even facilitating them. Their tools enact on a deeper level, eliciting what people know, feel and dream (Sanders 2002).

Eventually, the model could be reinterpreted and adapted to identify similar skilling dynamics in different practices.

## 5. Acknowledgements

This paper presents reflections from the research tasks carried out by the authors for the DiDIY Project proposal, which addresses the call ICT 31-2014 Human-centric Digital Age of the Leadership in enabling and industrial technologies, Information and Communication Technologies Horizon 2020 work programme. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 644344. The views expressed in this paper do not necessarily reflect the views of the EC.

### References

- Ackermann, E.K., 2013. *Cultures of creativity and modes of appropriation: From DIY (Do It Yourself) to BiIT (Be In It Together)*, Billund.
- Anderson, C., 2012. *Makers: The New Industrial Revolution*, Toronto: McClelland & Stewart.
- Attewell, P., 1990. What is Skill? *Work and Occupations*, 17(4), pp. 422–448.
- Benkler, Y. & Nissenbaum, H., 2006. Commons-based peer production and virtue. *Journal of Political Philosophy*, 14(4), pp. 394–419.
- Boza, L.E., 2006. (Un)Intended Discoveries Crafting the Design Process. *Journal of Architectural Education*, 60(2), pp. 4–7.
- Bria, F., 2014. *Digital Social Innovation*. Second Interim Report for Nesta. London.
- Cortoni, I., 2015. Le sfide della digital education. In L. Cianfriglia, ed. *Il service design thinking: innovare la scuola con metodo*. Parma: Gruppo Spaggiari Parma.
- Deliot, B., 2015. Ours to Master: *How makerspaces can help us master technology for a more human end*, London.
- Fox, S., 2013. Paradigm shift: do-it-yourself (DIY) invention and production of physical goods for use or sale. *Journal of Manufacturing Technology Management*, 24(2), pp. 218–234.
- Hilscher, S. & Smith, A., 2014. Community-based digital fabrication workshops: A review of the research literature. SPRU Working Paper Series, 08. University of Sussex.
- Hoftijzer, J., 2009. DIY and Co-creation: Representatives of a Democratizing Tendency. *Design Principles & Practices*, 3(6), pp. 69–81.
- Manzini, E., 2015. Design, *When Everybody Designs: An Introduction to Design for Social Innovation*, Cambridge, MA: The MIT Press.
- Mellis, D.A., 2014. Do-it-yourself fabrication of electronic devices. *IEEE Pervasive Computing*, 13(3), pp. 22–29.
- Partnership for 21st Century Skills, 2008. 21st Century Skills, *Education & Competitiveness: A Resource and Policy Guide*, Tucson, AZ.
- Ree, R., 2011. *3D Printing: Convergences, Frictions, Fluidity*. PhD thesis, University of Toronto.
- Sanders, E.B.E., 2002. From user-centered to participatory design approaches. In J. Frascara, ed. *Design and the Social Sciences Making connections*. New York and London: Taylor & Francis Books Limited, pp. 1–8.
- Söderberg, J., 2013. Automating amateurs in the 3D printing community: connecting the dots between “deskilling” and “user-friendliness.” *Work Organisation, Labour and Globalisation*, 7(1), pp. 124–140.
- The European Parliament and the Council of the European Union, 2006. Recommendation of the European Parliament and the Council of 18 December 2006 on key competencies for lifelong learning. *Official Journal of the European Union*.
- Walter-Herrmann, J. & Büching, C., 2013. *FabLab: Of Machines, Makers and Inventors*. Transcript-Verlag.
- Watson, M. & Shove, E., 2008. Product, Competence, Project and Practice: DIY and the dynamics of craft consumption. *Journal of Consumer Culture*, 8(1), pp. 69–89.

# LOOKING FORWARD

Nottingham Trent University and Cumulus would like to thank the following who worked in partnership to enable 'In this Place' to happen:

Aēsop

Bonington Gallery

Broadway Cinema

The Bureau of European Design Associations (BEDA)

Confetti Institute of Creative Technology

Experience Nottinghamshire

m360

Nottingham Express Transit (NET)

New Art Exchange

Nottingham Castle Museum and Art Gallery

Nottingham City Council

Nottingham Conference Centre

Nottingham Contemporary

Sarah Connor, Marketing Executive, Nottingham Trent University

Sarah Dossor, Research Office Team Leader, Nottingham Trent University

Tracey Newton, Marketing & Academic Administration Manager, Nottingham Trent University

Nottingham Trent University Staff and Student Volunteers

from this place.....

The next Cumulus Conference will be in Hong Kong between 21-24 November 2016.

The theme of Cumulus Hong Kong 2016 is 'Open Design for E-very-thing' and will be hosted by Hong Kong Design Institute, a member of Vocational Training Council of Hong Kong.

Information can be found at:  
[www.cumulus.hkdhongkong2016.org](http://www.cumulus.hkdhongkong2016.org)

For more information about Cumulus go to:  
[www.cumulusassociation.org](http://www.cumulusassociation.org)



Design and artwork by One Studio.  
[weareonestudio.co.uk](http://weareonestudio.co.uk)

Document Edited by VSDB Consultancy (London, UK)



SCHOOL OF ART & DESIGN  
NOTTINGHAM TRENT UNIVERSITY  
NOTTINGHAM  
NG1 4BU  
UK

**Tel:** +44 (0) 115 9418418  
**Email:** [adb.research@ntu.ac.uk](mailto:adb.research@ntu.ac.uk)  
**[www.ntu.ac.uk/art](http://www.ntu.ac.uk/art)**

LIKE US AT

 [www.facebook.com/ntuart](https://www.facebook.com/ntuart)

FOLLOW US AT

 [www.twitter.com/ntuartdesign](https://www.twitter.com/ntuartdesign)  
 [www.instagram.com/ntuart](https://www.instagram.com/ntuart)

**This publication can be made available in alternative formats.**

©Nottingham Trent University and may not be reproduced or transmitted in any form in whole or in part without the prior written consent of Nottingham Trent University.

ISBN 978-0-9928878-1-0