In the making

Digital fabrication and disability

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bring us new tools then
register us designers

Scott Thurston, “for Roger Fowler”, PhD thesis

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List of abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
AHRC	Arts and Humanities Research Council
BBC	British Broadcasting Corporation
BSL	British Sign Language
BTEC	Business and Technology Education Council
CAD	Computer Aided Design
CBA	Center for Bits and Atoms
CIC	Community Interest Company
CNC	Computer Numerical Control
DOI	Digital Object Identifier
DRUK	Disability Rights UK
FabLab	Digital Fabrication Laboratory
GCSE	General Certificate of Secondary Education
HND	Higher National Diploma
JPEG	Joint Photographic Experts Group
LCD	Liquid Crystal Display
NESTA	National Endowment for Science, Technology and the Arts
PLA	Polylactic Acid
STEAM	Science Technology Engineering Arts and Math

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A note to the reader

Figure 1.1. An assistance dog checks out her human companion's design.

Hello. Thanks for your interest in this book. I do hope that you will choose to go on and read it. To help inform your choice, I'd like to offer some indication of who I had in mind when I was writing. The book draws on the findings from a UK Research Council funded project, which set out to explore how disabled people might benefit from digital fabrication technologies, particularly 3D printing. As the book has its roots in a research project, there will be some citations and critical evaluation to help contextualize and evaluate the findings. However, this text is not just for academics! I have tried to write for anyone who has an interest in experiences of disability as they intersect with digital technologies, maker spaces, and/or creative processes. Alongside an account of the research, you can engage directly with the creations and experiences of our project participants. Our investigation was co-constructed with a network of disabled people from Greater Manchester, UK. To honor their contribution to the project, I have foregrounded their voices, images and experiences whenever possible – especially in Chapters 3 and 4. This book is not a technical or scientific guide to 3D printing. Rather, it employs approaches from the humanities in order to explore culturally and aesthetically the process of turning data into things. Some academic theories

and concepts are employed to help me do this. However, I have included 'take-aways' at the end of each chapter. So, if the citations ever become too dry for your taste, you can find a user-friendly summary of insights and suggestions in bullet-point form. Whatever your reasons for reading, I hope that the achievements of our collaborators inspire you to consider the potential of digital fabrication in your own context, whether you are an expert maker or someone who is just curious about the possibilities.

Chapter 1

Introduction

Origins

The material in this book was generated by a UK Research Council funded project, "In the Making", which set out to explore how disabled people might benefit from digital fabrication technologies, and 3D printing in particular. The project began with the researchers visiting digital fabrication laboratories (often known as FabLabs or makerspaces) across the UK to learn about existing practices. We – researchers, collaborators and stakeholders – wanted to find out whether disabled people were already accessing makerspaces and, if so, what challenges they faced. Based on our findings (detailed in Chapter 2), we then organized a series of workshops to explore digital fabrication with disabled people. The research grant allowed us to buy entry-level 3D printing equipment, and expert creative and technical facilitation.

Over an 18-month period spanning 2015-16, we provided 3D printing equipment and approximately 100 hours of tuition to over 100 disabled people, their supporters, families and friends. Our mobile digital fabrication laboratory toured venues in Greater Manchester, a conurbation in the northwest of the UK which includes many communities affected by post-industrial decline. Our venues set out to be non-typical of the usual makerspace, which can imply that only the technically adept are welcome, in order to be accessible to as wide a range of people as possible. Sites included a garden center, the BBC at MediaCityUK, community arts centers and public libraries. In each location we invited people to play with the technology, ask questions, join ideas workshops and participate in training sessions.

The approach throughout was "I can make it". We used this phrase with conscious reference to the layers of meaning it contains. Alongside the sense of physically making a useful or beautiful object is the abstract sense of "making it" by succeeding in life, crossing the finish line, achieving a goal. We set out to show that digital fabrication can support the "I can make it" ethos through its ability to empower people who are traditionally excluded from economic success and social status (Connolly 2017). With Joe McLeod-Iredale, founder and director of Daedalus Design (http://www.daedalusdesign.org/), we developed an inclusive pedagogy entitled "Digital Fabrication for the 99%" (2016). You can read more about this on the book's website. Everyone, no matter their physical or mental capacities, was supported to be actively

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