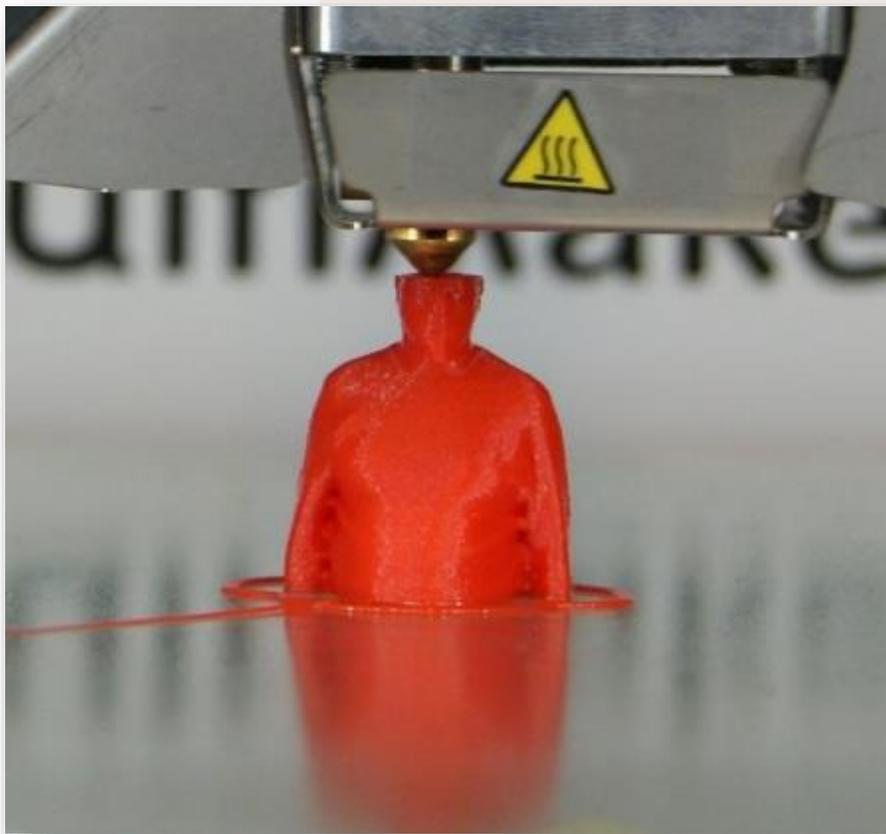


# 'In the Making'

## AHRC Connected Communities Project

### An External Evaluation



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November 2018

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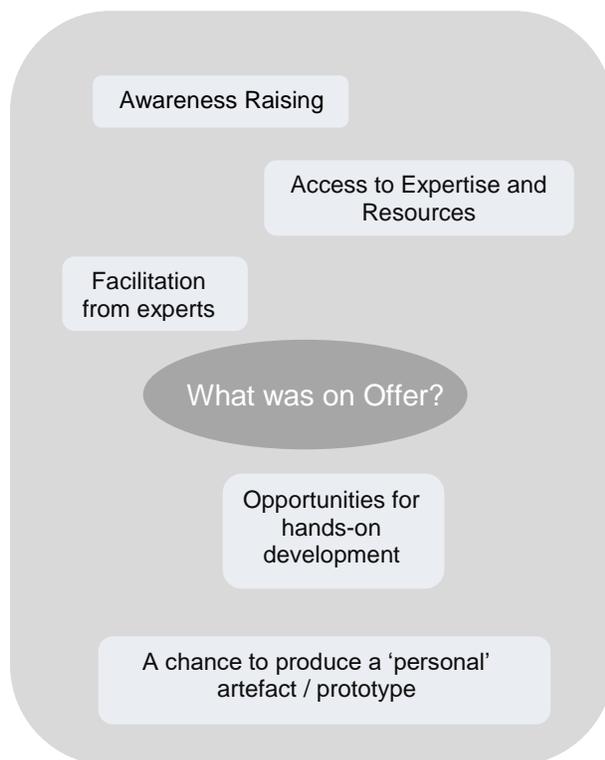
## Background

This report provides an external evaluation of the 'In The Making' Connected Communities Project, an initiative funded by the Arts and Humanities Research Council (AH/M006026/1). The project's aim was to explore the potential of digital fabrication to empower disabled people as "makers of their own solutions". It offered a series of accessible 3D printing workshops in a range of community venues in Greater Manchester.

Six workshops took place between September 2015 and January 2016. The two-day courses were widely advertised, free to attend, and non-selective. The recruitment strategy targeted people who identified themselves as disabled, or as having experience with disability (e.g. as a carer), but no one was excluded. Travel, subsistence, and caring costs were met wherever possible. Approximately, 100 people engaged with the courses.

## What the Course had to Offer

As already noted, the courses ran for two full days at a number of centres in the Greater Manchester region. They promoted participant development in a number of ways:



In greater detail:

<b>Awareness Raising</b>	Provided an introduction to 3D design software
<b>Access to Expertise</b>	Specialist help was available from a product designer to use the software
<b>Expert Facilitation</b>	Facilitation was offered to provide the 'creative generation' of ideas for things to print
<b>Hands-On Development</b>	There were opportunities for participants to design and print a prototype

## Methodology

This report provides an external evaluation of the above initiative based on evidence collected from in-depth semi-structured interviews, questionnaires and unsolicited emails from participants. The evaluation took place between May and July 2018. The evaluation was framed in this timescale in order to 'allow a longitudinal cohort study that could identify any long-term impacts and/or behavioural change as a result of participants' engagement with the project.'

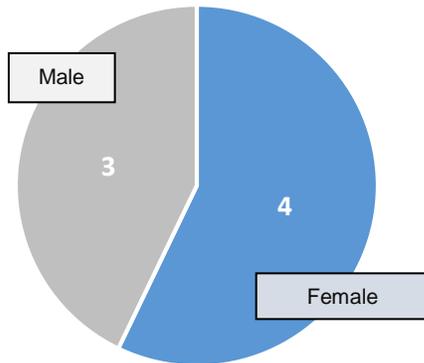
The timescale (two years) between the original project and this subsequent data collection inevitably means that the perceptions of only a small minority of participants is represented. The 'complex health needs and diverse communication strategies of many participants pose particular challenges'. Despite repeated attempts being made to engage, only a small number of participants participated in the evaluation.

It is clear that, for the seven participants represented here, attending the course had been very valuable and worthwhile. The analysis that follows clearly illustrates this. Despite the low response rate, this analysis does provide the reader with an insight into what the initiative can achieve.

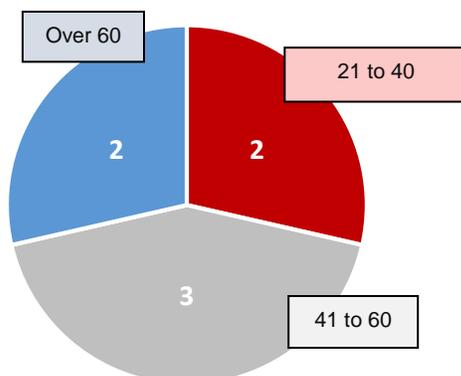
## Section 1. The Sample

This evaluation revealed that the course was highly successful in attracting a widely diverse group of people, as measured by a number of dimensions.

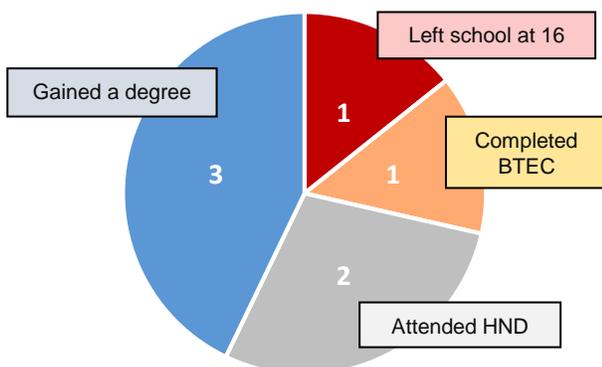
**Exhibit 1 (a). The Sample by Gender**



**Exhibit 1 (b). The Sample by Age**



**Exhibit 1 (c). The Sample by Formal Education**



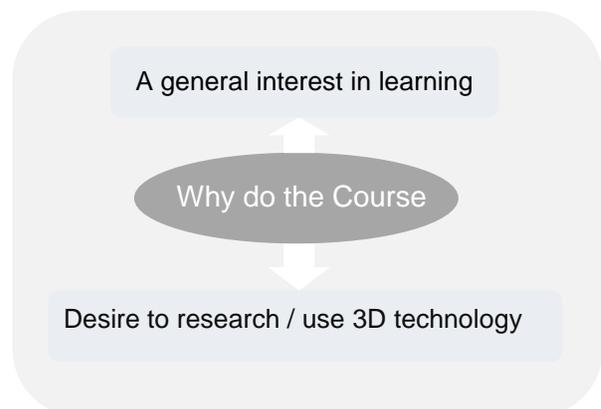
Of the seven respondents, four were female and three were male. They fell into three age ranges, with two aged between 21 and 40, a further three aged between 41 and 60, with the remaining two being over 60. They varied in the level of formal education they had received. One respondent had left school at 16. Another had completed a BTEC course. Two had attained HND, with the remaining three having gained a degree.

The participants had come to the course with a range of physical and mental health issues, affecting both their mobility and their capacity to cope socially. Only one respondent had been born with their disability, with the remainder becoming disabled later in life, in one case as the result of an accident.

The participants had worked variously in a professional capacity in education and training, advertising, engineering and administration. Only one respondent was currently unemployed. Three of the participants were now retired, two as a result of their disability. Three were actively involved in charity work, either voluntary or paid.

Having learned something about the diversity of the sample, attention now shifts in the next section, to providing an understanding of why participants had chosen to engage with the course.

## Section 2. Why do the Course?



*In a number of cases, participants were exploring the technology's potential to solve problems created by their particular disability*

Responses fell into two broad categories. Some participants expressed a general interest in learning. Others had a more specific desire to research 3D technology. In a number of cases, participants were exploring the technology's potential to solve problems created by their particular disability; an important outcome being that they gained a sense of ownership of their final products.

The course sounded 'interesting'. It was an opportunity to try 'something new'. It appealed to a 'drive to solve problems'. It was 'potentially useful' and 'life enhancing'.

Some participants had a strong interest in technology and wanted to learn more. One thought that the course represented 'a rare and special opportunity' to do something usually very expensive and complicated. Finally, one participant had a very specific aim in mind - here was an opportunity to learn about a life-changing technology that could take on the 'manual work', making it possible to translate artistic ideas. These examples will be explored in greater detail a little later in this report.

### Section 3. Impact – A Detailed Analysis

"I'm really aware that when I try to describe the up-shot of me taking part it sounds so over-the-top, even to my ears but it really has had a **profound effect on my confidence, my thinking and my fear levels**. The workshops came along at **just the right time** and I can't thank you enough for creating this experience. For me it is as much about the **people I've met**, the **sense of optimism** and the talk of **future possibilities** as it has been about discovering the **fantastic technology** itself. And wherever you take it from here I would really, really **love to be involved**."

"I would like to say a very big thank you to you and the team. Today has **inspired me to progress my deflated creativity**. Having a disability can't half get in the way and **stop the things we aspire to**. but today's atmosphere **lifted me**, everyone's **creative juices were flowing**. The relaxed atmosphere and informative tuition was sublime. It **helped me interact** with people on all levels, **sharing ideas** and inspirations. I would most certainly recommend this project and would **definitely attend future programs** like this".

(Authors' emphasis added)

The two comments above, sent as unsolicited emails, are very positive. They represent much of what is to follow, based on a detailed analysis of participants responses to engaging with this course.

From their comments, both respondents came away enthusiastic, excited and highly stimulated.

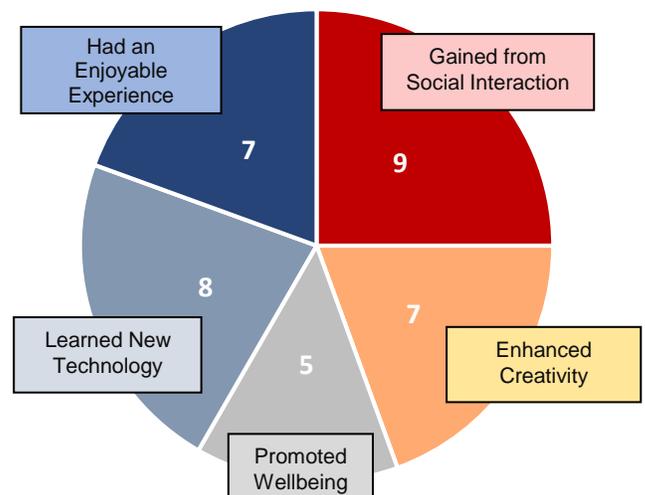
For these participants, the course came along at just the right time, with both providing a reminder of the debilitating impact that disability can have. For the first respondent, attending the course has had a profound effect on 'confidence, thinking and fear levels'. The second respondent was now inspired to rekindle 'deflated creativity'. The course had enabled the participants to access exciting new technology. But it went further than this. It promoted stimulating social interaction; 'creative juices' flowed and 'ideas and inspirations' were shared.

Both came away from the course with a renewed sense of optimism. Both were eager to be involved in any future initiatives.

Many of the messages above will emerge again a little later in this report, with evidence presented as four case studies. For now, a more detailed analysis of specific benefits follows:

Participants were asked to identify the benefits they had gained from attending the course. They were able to identify a range of positive outcomes, falling into five broad, but overlapping, categories as represented in Exhibit 2 below:

Exhibit 2. Perceived Benefits (N=34)



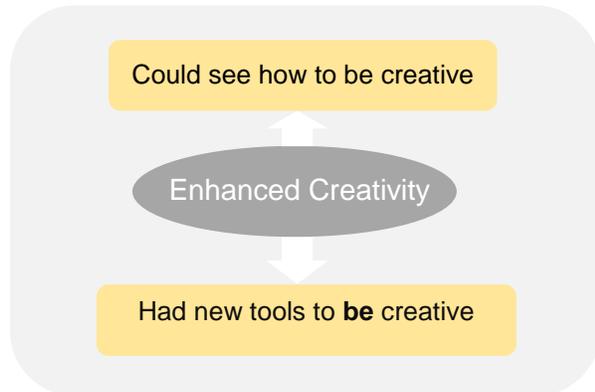
For all seven respondents, the course had given them the opportunity to engage in a new experience, variously described as 'very enjoyable', 'stimulating' and 'rewarding'.

These dimensions are now considered in greater detail:

### Learned a New Technology (8 Comments)

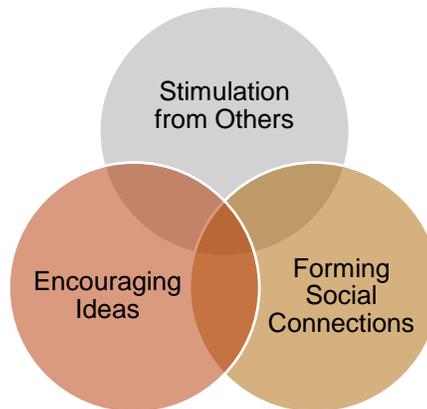
<b>Learned a New Technology</b>	Respondents gained:
	An awareness of the technology and an understanding of how it works
	Practical skills needed to use the technology
	An insight into the potential of the technology and its uses
	An appreciation of how the technology can be used for their own benefit.

### Enhanced Creativity (5 Comments)



<b>Enhanced Creativity</b>	Gaining confidence in using the technology meant that:
	Participants' horizons had been widened. They could now see how they could make use of the technology creatively
	Respondents now had a new tool to overcome their disability and help them realise their creativity.

### Gains from Social Interaction (9 Comments)



The relaxed atmosphere and positive group interaction meant that participants were:

- stimulated by meeting new people from different backgrounds
- able to exchange ideas and engage in critical discussion, which promoted creativity
- encouraged to develop friendships and networks.

### Promoted Wellbeing (5 Comments)

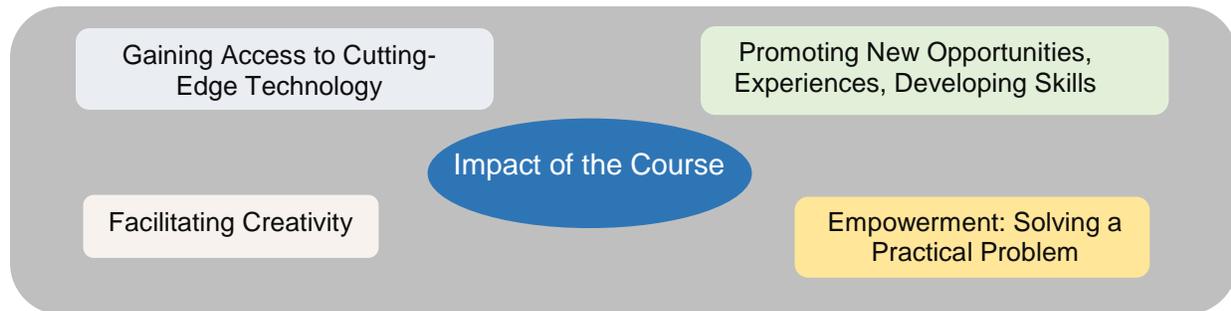


As a result of attending the course, participants had:

- Reduced their social anxiety and fear
- renewed their optimism about the future
- gained confidence
- been empowered to improve their personal circumstances

## Section 4. Impact – Four Case Studies

These Case Studies provide the opportunity for individual participants to ‘tell their own story’. Certainly, some of the earlier messages relating to the quality of the learning experience emerge again. We learn once more of the stimulation and excitement associated with exploring a new and exciting technology, and of the opportunities provided to engage constructively in collaborative learning. However, it is also clear that participants have engaged on this course with somewhat differing motivations. What emerges here is how the experience has empowered these individuals to work towards achieving their personal goals.



### Case Study 1 – Gaining Access to Cutting Edge Technology

John is a qualified engineer in his late 50's. He has had a varied career. Since 2008 he has been engaged in voluntary work. He is profoundly deaf and has Asperger's syndrome.

John retains a passion for engineering and technology but also has a wide range of interests. As a result, he attends numerous courses and workshops. He chose the course because:

“it was an extremely rare and special opportunity. CAD, engineering, construction, architecture and 3D printing are very difficult, very complicated and expensive for disabled people to access. It was probably the first accessible 3D course for disabled people in the UK.”

However, the course offered John much more than simply ‘access’. It enabled disabled people to:

“... learn, work and communicate. I was also able to meet experts and BSL interpreters.. I got to use an Ultimaker, and I learned about the resources available such as the 3D warehouse website.”

All of this clearly stimulated John. Following the course, he has continued to explore 3D technology and its application to art, construction and engineering in a variety of ways:

“The 3D Warehouse website has millions of drawings I can access. I bought two books about AutoCAD and Sketchup....I have explored the possibility of attending a FabLab in Ellesmere Port.”

***“it was an extremely rare and special opportunity... It was probably the first accessible 3D course for disabled people in the UK.”***

John has a strong thirst for knowledge, pursuing a wide range of interests. It is clear that not only did he get a great deal from attending the course, but has emerged highly stimulated to seek more.

## Case Study 2 – Promoting New Opportunities, Experiences, Developing Skills

Liz is a female arts graduate in her mid-40's. She has worked variously in administration, customer service, IT support and training. Because of a disabling physical condition, she retired from work 6 years ago.

Despite knowing very little about 3D printing beforehand, Liz was attracted to the course because:

"I'm always interested in opportunities for disabled people, and as a self-proclaimed 'geek', welcomed the chance to get to grips with a new technology"

For Liz, the social aspect was a key positive element. She had "enjoyed herself and met interesting people", but the benefits extended beyond this:

"The 'hands-on' bit was fantastic; getting to grips with the software and playing around with ideas. I developed my skills and made a bracelet."

Two years on, Liz remains hugely positive about the course:

"New experiences, new skills and new opportunities, Go for it! What's not to like?"

*"New experiences, new skills and new opportunities, Go for it! What's not to like?"*

Liz is a self-proclaimed 'geek', strongly attracted to participate by the chance offered to engage with a new technology. However, hands-on experience offered by the course, and successfully completing the task has given her more. She has emerged highly enthusiastic and with new skills in place.

## Case Study 3 – Facilitating Creativity

Helen is in her mid-60's. She is a retired art teacher who retains a passion for sculpture and regularly exhibits her work. She has serious multiple health issues, following a traffic accident.

Helen's attendance at the workshops was, for her, a sustained exploration of how the technology might support her practice as a sculptor:

"I get irritated because I can't do everything I want. I can't make things the way I used to. I haven't got the strength or dexterity so this allows me to realise ideas with the software doing the manual work. I'm hoping to get past this introduction to the software so I can then explore the possibilities."

The second part of the comment above indicates that Helen is now seeking to build on the experience she gained on the course to enhance further the quality of the work she produces. The message below is that 3D technology has the potential to facilitate creativity for people currently impaired by their disability:

"It makes difficult things really simple. I think this technology is wonderful...the thought of how it could be used. I'm fascinated by the way it allows you to translate your ideas – the interface. It's another tool really. I just want to carry on making things and this is in fact the way forward."

*"It makes difficult things really simple. I think this technology is wonderful..."*

Helen's story is a further reminder of the stultifying impact disability can have on an individual's attempts to realise their creativity. Her benefit from attending this course has been twofold. New horizons have been opened, with the technology providing real opportunities for Helen to realise her own creative potential. In addition, she now emerges from this experience with a much fuller insight into the potential such technology has, to do the same for others.

## Case Study 4 – Empowerment: Solving a Practical Problem

Julie uses an electric wheelchair, having been severely disabled since early childhood. She is in her mid 50's. She has had a varied career in office work and administration. She is currently working for a disabled charity.

A number of factors influenced Julie's decision to participate on the course. Some were altruistic. She explains:

"I do a lot of charity work. I'm very much into inclusion – making sure that people with disabilities get out and socialise and integrate. I like to get involved in lots of things and try to pass on any information I gain."

For Julie, there were also personal objectives:

"My interest in technology is really about how it can enhance my life. I'm very into overcoming problems, so anything that's new and out there, and could help me overcome my disability, I'm interested in and I'm going to get involved."

*"My interest in technology is really about how it can enhance my life. I'm very into overcoming problems, so anything that's new and out there, and could help me overcome my disability, I'm interested in and I'm going to get involved."*

After attending the first session, Julie found that the course could address a very specific need:

"I started to wonder what I could achieve with the technology. I've had long term problems with my hands and trying to get a splint that would fit my fingers and stop them distorting. The medics told me that they couldn't provide me with a splint that would fit – it's caused me a lot of problems. I thought 'I wonder if I could use the 3D workshop to create my own bespoke finger splint?'. So, I tried to design a smaller version that would fit me. When I went to the other sessions, I had this goal in mind."

As a result of the knowledge she gained on the course, Julie now had the confidence to question the medical judgement relating to her case:

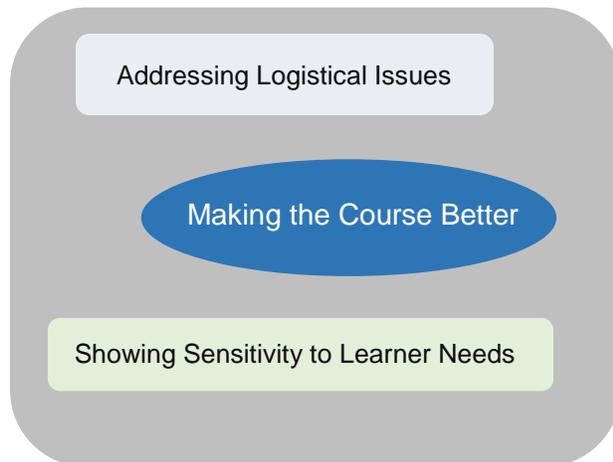
"After the course, even though my prototype splint hadn't really worked, I thought surely hospitals must be able to produce different sized splints using this technology. I researched it and I found, in fact, there were different sizes. I explained this to the physio. She checked and said 'yes, you're right'. So, in the end, I did get the splint."

Clearly the course had empowered Julie. As she herself concluded:

"If I hadn't done the course, I would never have had the knowledge to check this out or the confidence to question the medics."

Julie's is a real success story, on a number of fronts. She was able to use the course to address successfully a particular problem faced as a result of disability. With this success came a growth in confidence, exemplified by the fact she could now engage constructively with medical staff. Finally, given her strong commitment to inclusion, Julie is now in a position to inform others about what courses like this can offer in terms of promoting self-development.

## Section 5. Making the Course Better



Participants were asked to reflect on their experience and identify aspects which could be addressed to enhance learning quality.

All respondents were very positive about the learning experience that had been offered. However, they did identify a number of issues that they felt should be addressed to enhance its quality.

A number of issues emerged, falling into two broad categories, 'logistics' and 'sensitivity to learner needs'.

### Logistics

Respondents felt, that in its current form, the course was too short.

### Making the Course Longer

The course had only been offered over two days which, as explained below, had brought with it limitations to the learning experience on offer:

<b>The Course was Too Short</b>	Instruction was crammed and they were only able to receive limited personal attention
	Participants did not have long enough to produce a working prototype
	Respondents encountered bottlenecks caused by the lengthy printing process.

All participants would have welcomed the opportunity to take part in a longer course.

### Sensitivity to Learner Needs

Organisers need to be aware of the following:

- sitting for long periods can be painful
- having sessions on consecutive days can be challenging for disabled people
- participants have different levels of technical ability/knowledge

Finally, greater attention should be given to publicising more widely what FabLabs have to offer. Although several participants were actively engaged in community work and considered themselves 'clued-up' about local provision, they had been unaware of the facilities on offer prior to this initiative

## Section 6. The Way Forward

"I would like the chance to develop my skills through work on **individual, group and community projects.**"

"I would have the course **going on for longer, more sessions** and **smaller groups**, maybe a max of 5 people, and maybe try and have **two levels** – one for those who are a bit more tech savvy or have experience in it, and one for those who are less."

"My preferred format would be a **fixed time per week**, so there was a greater incentive to go and the opportunity to **build community.**"

"I'd love to do a **structured course** – 10 sessions would be great. It would be nice to **combine that with a drop-in facility** after you've completed the course. **You might even get that confident that you could teach it to others.**"

"I would definitely be interested in a further course. I'd especially like to **get a qualification** to assist or **teach others.**"

(Authors' emphasis added)

For these seven participants, attending this course is just the beginning.

There is a strong appetite for further study. All seven respondents would like to attend another course. Six were emphatically positive about this.

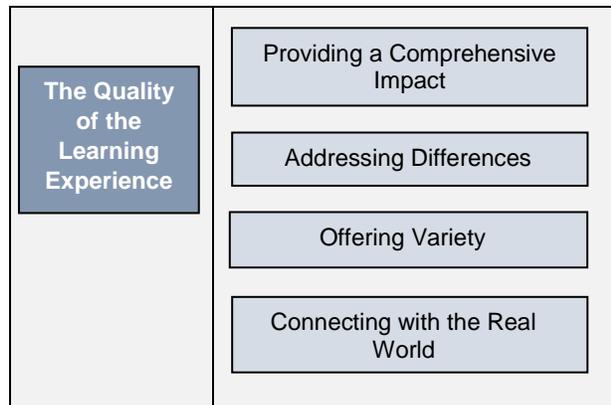
The five comments sequenced above provide an insight into what the respondents are looking for.

Within this sample, four favoured a longer structured course (possibly involving up to ten weekly sessions) that would lead to a qualification and “build relationships and community”. Two participants required the provision to be sufficiently rigorous that it would qualify them to teach. One participant favoured a less structured approach offering ‘drop-in’ sessions. Another wanted a hybrid approach combining formal provision with a drop-in facility. Whatever form the course might take, provision should be geographically accessible.

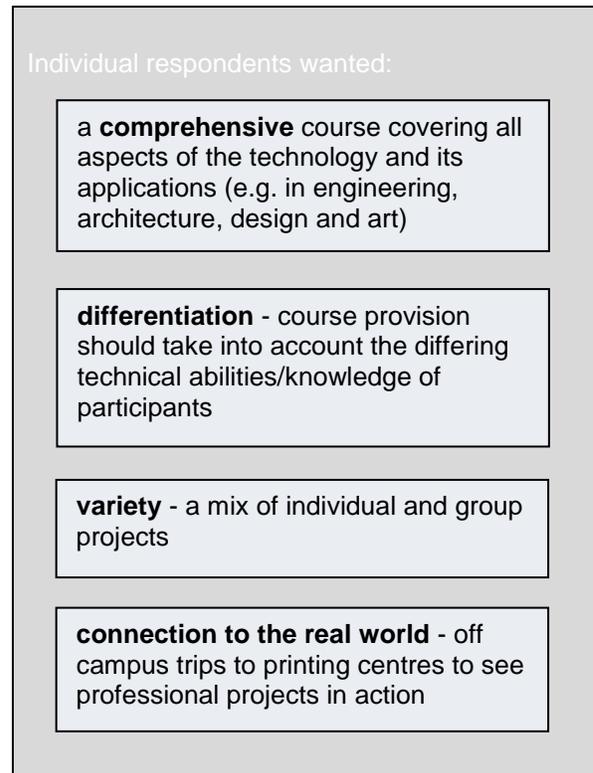
The important message here is that the participants are now highly stimulated to move forward. The course clearly helped participants to address immediate needs. Now the objective is to build on this. What emerges here is a strong future-orientation. Participants now want provision to take their learning experience forward; enabling them to share with others, either in some form of teaching capacity, or in relation to informing community work.

### Enhancing the Learning Experience

A number of factors contribute to determining the quality of the learning offered by any course. When considering the nature of future provision, participants touched on four of these:



A summary of participant perceptions in relation to learning quality ends this report.



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Funded by Shaw Trust and The University of Salford

