MAKING SPACES

Developing equitable practice with youth in makerspaces

Ideas and case studies from the Making Spaces project

Executive Summary

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Executive summary

Context

Makerspaces are informal multipurpose sites designed for collaborative hands-on learning and creative production, with or without tools. These rapidly proliferating spaces can provide ideal settings for growing participation in science, technology, engineering and mathematics (STEM), but in the UK to date, this potential remains predominantly unrealised, especially for low income and under-represented communities. There are some inspiring exceptions, but these pockets of creative practice are not widely known. This report aims to contribute to efforts to identify and share equitable practice for greater inclusion and participation in makerspaces.

Equity: The differential provision of resources according to need, ensuring that everyone has what they require to succeed. Part of a process of actively moving everyone closer to social justice by 'levelling the playing field'.

About this report

This report summarises and shares ideas emerging from the Making Spaces project, which can help practitioners support equitable engagement of young people from communities that are under-represented in STEM. It is primarily aimed at UK makerspace practitioners who:

- Are interested in adopting and developing more inclusive and equitable practice.
- Particularly work with young people from low income and under-represented communities.

Those leading programmes or developing activities with young people may find the ideas in the report particularly applicable to their work, but we hope that others in makerspaces may also be able to apply or translate some of the ideas for their situations.

About the Making Spaces project

The first phase of the Making Spaces project was undertaken between 2020-2022 and involved a collaborative partnership between researchers, practitioners and young people from three UK makerspaces. Work began just as the COVID-19 pandemic hit the UK, which compelled partners to think of innovative ways of working together and find hybrid solutions for their youth programmes. The research project is based at IOE: UCL's Faculty for Education and Society and was funded by Lloyd's Register Foundation.

Project aims

The Making Spaces project aims to:

- Start a national conversation about the value and importance of developing and embedding equitable and socially just practice within UK makerspaces.
- Support critical reflective practice among makerspace practitioners by developing and sharing evidence, suggestions and ideas for how makerspaces can start their own journeys towards inclusive practice.

The three partner makerspaces

As part of their involvement in the project, three makerspaces ran programmes to engage young people from under-represented communities with STEM. Each makerspace had a unique approach both in the type of programme they were running and the content delivered.

University Makerspace

Who they are: A physical workshop and research hub, based in a city centre university in the South East of England. This makerspace brings together people, perspectives, equipment, and expertise from a wide range of disciplines. Prior to their involvement with the Making Spaces project, they had not engaged minoritised young people from the local community.

What they did: Engaged approximately 100 young people (aged 14-18), predominantly from low-income, racially minoritised local communities in new workshops that were delivered virtually during the UK lockdowns, and face-to-face when permitted. Topics of the workshops included: coding and AI, designing clothing from waste, face mask embroidery, computer aided design for beginners and a careers workshop.

Community Makerspace

Who they are: Based on the outskirts of a city in the South West of England, within a local area categorised as in the bottom 10% of government indices of multiple deprivation. This makerspace aims to co-create projects with the community around technology, media and the arts. They already had pre-existing long-running programmes for youth in the local (predominantly low-income, white) community.

What they did: Delivered a weekly youth programme aimed at empowering young people to make positive changes in their communities and lives by giving them the tools to experiment, explore, and creatively learn how to use digital making technologies for social action. Approximately 180 young people (aged 10-18) took part in the programme that ran face-to-face when possible, and virtually when necessary due to the pandemic.

Digital Makerspace

Who they are: An online, grassroots innovation organisation, working with technology and people to shape the world for the better. They run accessible digital skills programmes for unemployed and under-employed young adults based in and around a city in the North West of England.

What they did: Ran a 'remote bootcamp' that built participants' coding and digital skills. The programme supported over 60 young adults (ages 18-30) predominantly from low-income, white, local communities who were ask risk of digital exclusion, to develop technical skills and expertise. The programme was virtual, self-paced and offered guidance in developing career prospects and pathways.

What the project involved

The Making Spaces project is a research-practice partnership through which university researchers collaborated with the three partner makerspaces and young people to understand, identify and document forms of equitable practice. At the start of the project, researchers, practitioners and young people developed and shared ideas and experiences about what equitable practice might involve. Practitioners then integrated these insights into their programmes, trying out and iterating specific ideas. Adult and youth co-researchers collected data to capture what this looked like in practice and what impact it had. More specifically, the project involved:

- **Meetings and visits to makerspaces:** researchers regularly connected with makerspace partners, practitioners and young people to capture their ideas and experiences and co-develop analyses.
- **Observations of youth engagement programmes:** researchers collected extensive field notes, photographs, physical artefacts and over 2300+ online data posts from makerspace sessions to understand the ways in which young people experienced these contexts, and how programmes were delivered.
- **Practitioner workshops:** researchers conducted two workshops with practitioners to co-develop understanding and ideas about social justice and equity.
- **Regular discussions and 14 interviews with practitioners:** researchers worked closely with 12 practitioners to understand their views and experiences of inclusive and equitable practice and share emergent insights. Practitioners incorporated these ideas into their programmes to make them more equitable and inclusive for young people.
- **Interviews with 17 young people:** researchers explored young people's experiences of the programmes and any outcomes from their participation.
- **Working with youth co-researchers:** 23 youth co-researchers were recruited from the 3 partner makerspaces and took part in a series of workshops within their settings (totalling 14 workshops overall). They were given training and support to conduct their own fieldwork, including interviews with makerspace practitioners, researching the makerspace setting and identifying what makes a welcoming and equitable space. Youth co-researchers also developed their own ideas and designs for equitable makerspace programmes. Overall, this strand of work resulted in c.105 youth-produced artifacts and portfolios.
- **Survey and evaluation development:** Researchers worked with makerspace practitioners and 20 young people to devise and pilot a survey that can be used to help evaluate the equity and inclusivity of makerspace programmes.
- **Advisory group meetings:** project research was informed, reviewed and discussed with 10 external, international advisory group members, who represented a range of relevant research and practice expertise.

Social justice/socially just:
The processes and outcomes of transforming power relations and removing injustices in society regarding the distribution of wealth, opportunities, privileges, respect and outcomes.

Key findings

The collaborative approach to data collection and analysis led to the identification of six 'key ideas' for how makerspaces can develop and deliver inclusive and equitable programmes for young people. The ideas are intended to support critical reflection among practitioners and are summarised as follows:

Idea 1: Develop a social justice mindset and culture

- Challenge wider social inequalities by understanding and foregrounding issues of equity and social justice.
- Reflect on and identify aspects of culture and practice that can be exclusionary.

Idea 2: Create safe, welcoming, sustainable, and inclusive spaces

- Protect young people from physical harm as well as care for them socially and emotionally.
- Value all young people for who they are and support them to feel a sense of ownership and belonging.
- Support long term social relationships and sustainable participation.

Idea 3: Work in participatory ways with young people

- Support young people to play an active and meaningful role in planning, designing and decision-making.
- Hear and enable young people's voices to make a difference and shape activity.
- Recognise and respect young people's knowledge, expertise and experiences.

Idea 4: Foster caring pedagogies and relationships

- Take account of relations of power and injustice, and respectfully centre young people and their needs.
- Support young people emotionally, culturally, pastorally to foster wellbeing, progression and positive outcomes.

Idea 5: Support young people's agency and social action through making

- Provide opportunities for young people to act and make decisions in their own learning and experience a sense of ownership and voice in their making.
- Support young people to engage in actions that are directed at social change.

Idea 6: Build capital, skills and progression

- Provide opportunities for young people to develop a range of capital and skills in areas such as, but not limited to, science, technology, engineering, maths, art, crafts, creativity and beyond.
- Support young people's pathways and progression in ways that benefit them, their communities and wider society.

Put these ideas into practice by using our ***Key Reflective Questions for Practitioners*** *- CLICK HERE to view the full table on our website.*

What did young people gain from participating in makerspace programmes?

Data was collected from young people who had taken part in programmes that had been informed by ideas of equity and inclusion. Analysis identified ten key areas in which young people believed they had benefitted as a result of participating. These included:

94% of young people felt more empowered

88% felt that they had grown in confidence

88% learnt new STEM skills and knowledge

Agency: A young person's capacity to act and take action in their learning and lives, which also links with the extent to which they experience a sense of ownership and 'voice' in their making.

What did practitioners gain from taking part in the Making Spaces project?

Analysis of data from practitioners who took part in the project showed that they felt being involved had helped them:

- Increase in their understanding of equity issues.
- Develop more inclusive and innovative practice.

“We are young-person centred and that’s how we approach things”

Recommendations

Funders who are interested in supporting more equitable, inclusive and increased STEM participation might wish to consider how they can:

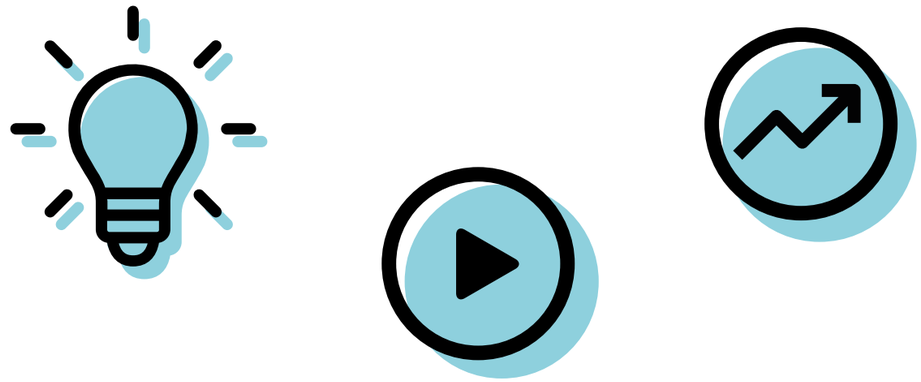
- Ensure that the activities and programmes that they fund are **informed by the six ideas** outlined in the report.
- **Support cultures of critical professional reflection** among makerspace staff and volunteers who work with young people, ensuring that practitioners have adequate time, resource and tools (such as the Making Spaces project Key Reflective Questions) to do so.

Makerspace practitioners may wish to:

- **Engage in critical reflection**, either alone or with colleagues, using the Key Reflective Questions and ideas summarised in the main report.
- **Explore some of the wider resources** listed in the report.
- **Connect** with other makerspaces to share ideas and develop a wider community of practice.
- Consider setting up a **youth advisory board** so that young people can be partners in reflection and planning.

Young people who are interested in helping makerspaces to be more equitable and inclusive might want to:

- Use the experiences and case studies from young people in this project as conversation points to **kick start discussions** with **peers** and **practitioners** about how best to support the equitable participation, engagement, voice, and agency of young people in their makerspaces.



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