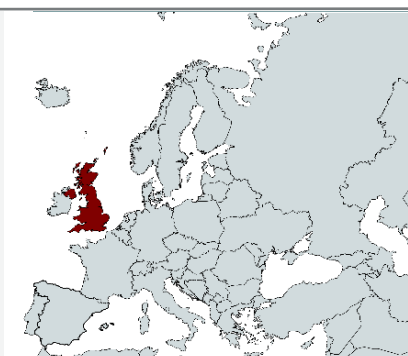


THE MAKERSPACE CHALLENGE

Imperial College London has pioneered a new form of outreach at White City, aimed at inspiring teenagers from disadvantaged backgrounds to experience and interact with science through their own creativity. The Makerspace Challenge Program offers young people aged 14-18 from one of London's most disadvantaged urban communities the opportunity to engage in a creative, innovative and entrepreneurial program designed to build practical and soft skills by taking an idea to working prototype, and potentially beyond.

The Makerspace builds on decades of Imperial's more traditional STEM outreach, aimed at inspiring students regardless of background to consider STEM subjects at university. The program is based in White City, where ICL has established their new biomedical campus, and is situated in the larger "Invention Rooms" center which also houses ICL's advanced hackerspace and a community engagement space. Participants develop a wide range of vocational technical skills using a variety of tools and equipment including traditional as well as cutting edge technology, such as 3D printers, laser cutters and scanners. In addition, they receive practical business skills training from the Imperial Business School on communication and negotiation, planning, financial management, marketing and sales.



Beneficiary group

2019 Spring Cohorts 7 and 8: 40 participants in total (53% female) from 20 different schools.

Demographic

Age: 14-18 years

Budget

\$50,000

Location

London

Primary outcome

Provide creative design and technical opportunities for local young people that are outside of their normal daily experience, and for those students whose schools no longer have this provision.

Goals

- Develop participants' technical vocational and business skills.
- Develop critical life skills necessary for employment: team-working, problem-solving, presenting and effective communication.
- Support personal growth, confidence and self-esteem.
- Provide opportunities for local young people to consider alternative career routes.

Milestones

Many participants within the two 2019 cohorts were younger (11-13 year olds) than anticipated, and the team noted that they demonstrated greater needs which impacted on overall program delivery. In the future, participants' will be required to be at least 14 years of age.

33 participants shared their work in a community showcase and in front of a panel of judges from The Economist and Imperial College

2 female participants were selected to present at the 2019 WeInnovate final at ICL in March. Both were trained and supported by the College's Enterprise lab and presented pitches to an audience of over 300.

2 girls were nominated for the 'Young Innovator of the Year Award' at the London Borough of Hammersmith and Fulham's Youth Achievements Awards, with Cindy winning the award.

- Many participants built adaptable desk or shelving to address living in small spaces. Some developed games, learning tools or innovative transport solutions, and others looked into community-oriented projects
- The team witnessed incredible transformations among participants in terms of confidence and personal development. Many considered the business skills and coaching day a key component providing vital transferable skills. Working with a Business School and Makerspace outreach graduate provides participants with a safe space to develop their communication and presentation skills.

Level of evidence

Level 1	Quasi-experimental
Level 2	Pre-post or cross-sectional
Level 3	Point-in-time study
Level 4	Performance metrics/stats
Level 5	Anecdotal evidence

Pre-participation surveys (Baseline attitudes to STEM subjects, studies, skills and competencies); Post-participation surveys; Participant feedback; Observational feedback from mentors and staff



Above: participants of the 2019 spring cohorts work on their projects.



Left, in the striped shirt: Aaron Vidal, the winner from the spring challenge cohorts. Aaron is in his final year at The John Fisher School in Purley. He created VISOR, a headset with a visor and incorporated voice assistant. Aaron had a complete attendance record, an impressive feat considering the distance he had to travel each week.

(Photos © ICL)

Future plans

- Continue to increase the provision of the Proto-Maker Challenge (11-14 years old) and local community activities to deepen engagement and create a pipeline for recruiting teenagers for the Maker Challenge program.
- Seek to engage and recruit young people who are disengaged and have lower motivation.
- Continue to explore opportunities to develop a program of work placements and internship opportunities for Makerspace graduates with local business partners.

Challenges

Reaching disengaged young people to participate in the program is an ongoing challenge. The Makerspace team will recruit a new community activity liaison to work directly with schools and community groups to provide less-commitment heavy activities and create a recruitment pipeline for the Makerspace. However this could create another challenge: balancing demand against eligibility criteria to ensure the program doesn't become overly competitive and discourage young people from participating.