In2science UK

2022

Impact Report

Improving social mobility and diversity in STEM

Foreword

I am pleased to report on a year of growing impact for our organisation, and hope you enjoy reading this as much as we did.

And there is more to come: as a trustee board we have been working closely with our growing senior team to develop a 5 year strategy for growth, and we are establishing board sub-groups to provide oversight - and really expert support - to driving that growth.

We will scale our core programmes of support to students in school year 12, our In2research programme, our support for Alumni into careers, and we will increasingly share insights from our work with policy makers. We share a deep belief in the moral imperative that underpins our work - social justice from which we all benefit, and social mobility for the fantastic young people we help.

Jonathan Flowers
In2scienceUK Chair of Trustees

2022 has been a year of exciting internal change at In2scienceUK. We have been working hard to lay the foundation to scale our work in the future.

In the new year we will be proud to officially launch our 2023-28 strategy. The strategy will take us into an exciting new stage of our development, focusing on developing our offer to reflect the changing needs of our community. Not only will we scale the work that we currently do, but we will offer new and different programmes to continue to best support our participants.

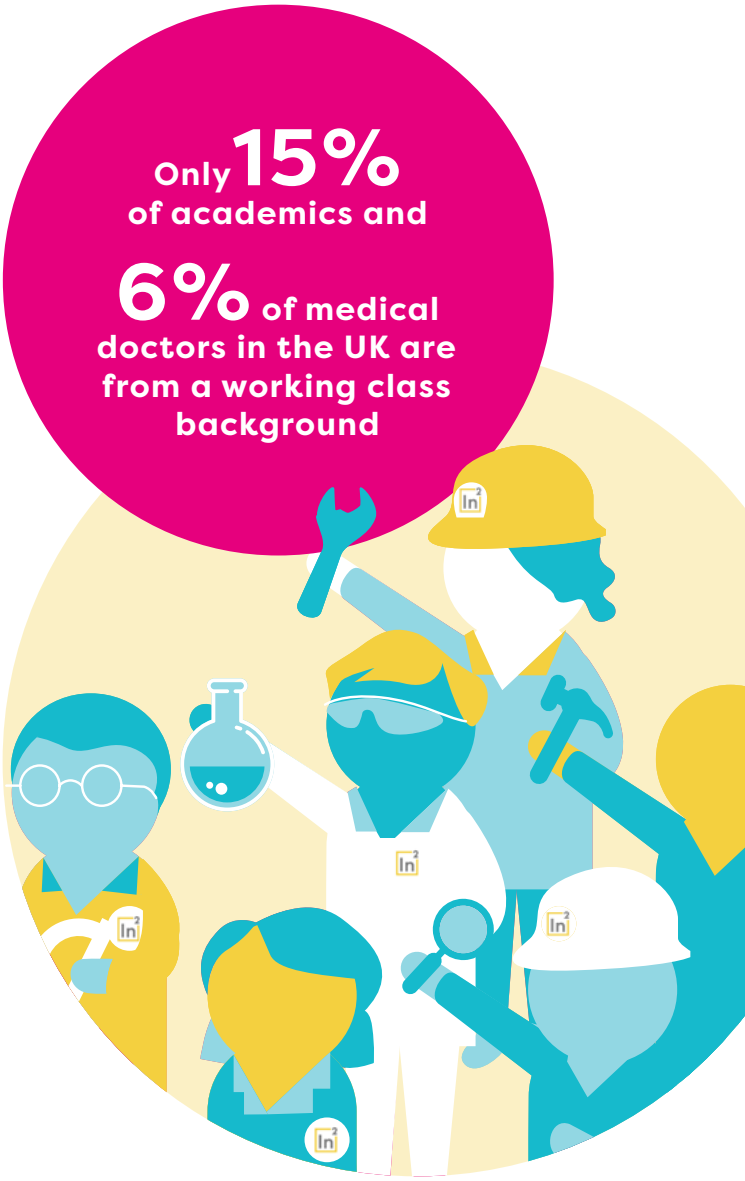
The 2022 data shows an organisation poised for success but working hard to bounce back from the effects of the pandemic, which has impacted many of our stakeholders. I am incredibly proud of the team's hard work and grateful for the continued support of our funders and partner organisations, who share our commitment to supporting the next generation to enter the STEM workforce.

Colby Benari
In2scienceUK Chief Executive Officer

Our Vision | Diversity in STEM

In2scienceUK is an award-winning charity that empowers young people from disadvantaged backgrounds to achieve their potential in science, technology, engineering and maths (STEM). We provide life-changing opportunities that improve our participants' access and aspiration for STEM education and careers.

Our participants face a number of overlapping barriers to progression in STEM careers and this is borne out in the data with only 15% of academics and 6% of medical doctors in the UK coming from a working class background[1]. Supporting access and raising aspiration for STEM careers is an important part of bridging the gap. We offer a range of programmes to tackle this issue.



The In2science summer programme, aimed at 16-17 year olds from disadvantaged backgrounds, offers a summer full of support, mentoring and skill building that culminates in a short placement in a STEM workplace. Students are supported to progress on to university, STEM jobs and apprenticeship programmes.

In2research

The In2research programme, aimed at university undergraduates and graduates, focuses on exposing participants to the academic research environment. The one-year programme, which features an eight-week research placement, prepares participants to apply for competitive PhD funding or to enter the academic workforce through other routes.

Both programmes are supported by the emerging Alumni Community, which will focus on supporting former participants and others into STEM careers.

In 2022 we delivered impactful programmes and reached participants across the UK. This was only possible with the dedicated support of our exceptional volunteers, funders, partners and the In2scienceUK team.

[1] Social Mobility Commission (2017) State of the Nation 2017: Social Mobility in Great Britain

Programme Overview

In 2022 we reached 766 participants through our In2science summer and In2research programmes despite continued pressures from Covid-19.

The In2science summer programme successfully supported 669 young people through a blended programme, involving face-to-face and online learning. For the first time since the start of the pandemic, we delivered 594 in-person, 1 to 2 week work experience placements, a significant increase from 245 1-day placements in 2021.

We saw continued growth in reach in the UK, building on our expansion last year in Manchester, Cardiff, Leeds, Liverpool, and for the first time expanding our reach further north to Edinburgh.

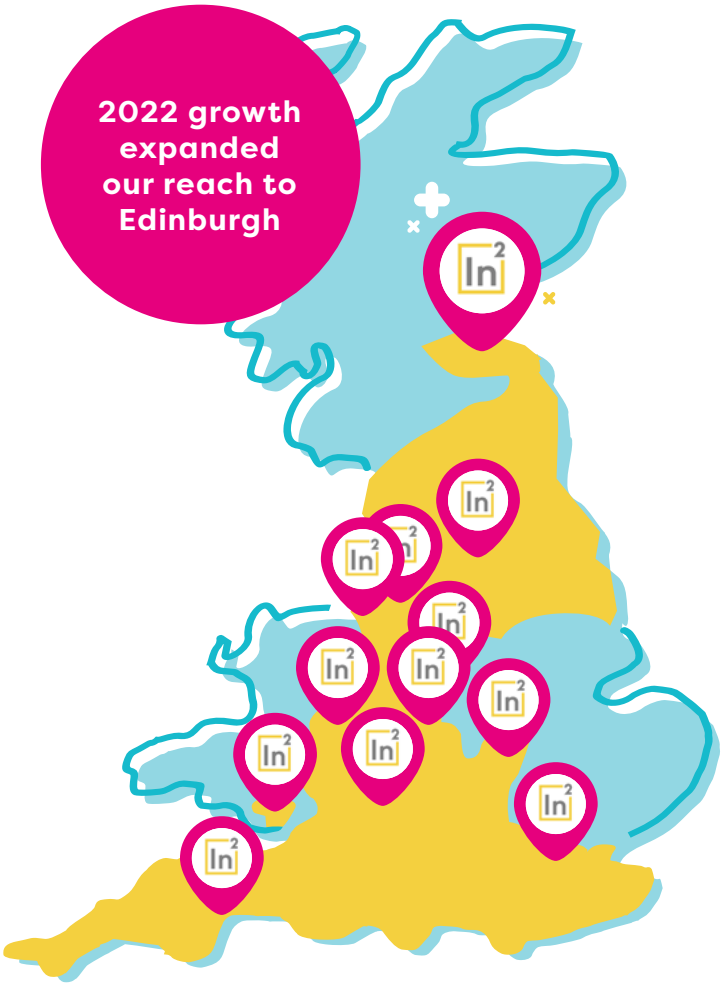
Our In2research programme has grown from a small pilot delivered with UCL in 2021 to an award-winning programme adopted across UCL, University of Cambridge and City University of London's science faculties, supporting a cohort of 50 participants in 2022.

"My experience on the **In2science summer programme** was amazing, I had the opportunity to gain a placement at a prestigious institution with a great supervisor who met my needs and more! She allowed me to not only work with her on her project but also introduced me to her colleagues in the lab who were all willing to explain and teach me new pieces of knowledge. It solidified my choice of neuroscience being one of the subjects I want to study at university."

Emiola, In2science summer participant who completed a placement at the Francis Crick Institute

"**In2research** has shown me that I have options, and that there is a place for me in research. After my placement at the Wellcome Centre for Human Neuroimaging, I was offered a job in the research team, and now I am currently looking to apply for PhDs. Whilst I'm not sure of my exact next steps, I know that In2research has given me a toolkit of skills to help me in my future."

Ruben, In2research programme participant



Improving access to STEM degrees, apprenticeships and careers

1 Increases the pipeline of UK STEM professionals

There is a **shortfall of STEM skilled workers** with the number of future technical jobs forecast to increase. Increasing the numbers of disadvantaged students in these careers would increase the UK's economic competitiveness[2].

2 Promotes social mobility

As STEM workers typically earn 20% more than in other fields, getting more young people from low-income backgrounds into these professions promotes social mobility and fights economic inequality[3].

3 Builds a more diverse workforce

Businesses with diverse and inclusive cultures perform better financially, reduce staff turnover, and maintain increased creativity and problem-solving capacity. [4] [5]

4 Grows a science literate society

There are economic, political and social benefits to increasing science capital in all segments of the UK. In this technological age, it is vital that all people have the tools to communicate effectively, assess complex information and distinguish fact from fiction.

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[2] Broughton, N. (2013) In the balance: The STEM human capital crunch, Social Market Foundation

[3] Greenwood et al., (2011) The Labour market value of STEM qualifications and occupations, Department of Quantitative Social Science, Institute of Education

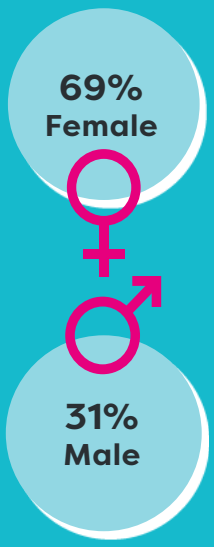
[4] Desvaux, G., Devillard-Hoellinger, S. and Baumgarten, P. (2007) Women Matter: Gender diversity, a corporate performance driver, McKinsey & Company

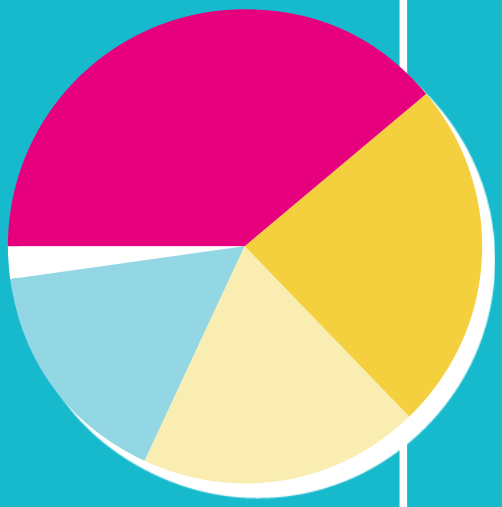
[5] Forbes Insights (2011) Fostering Innovation Through a Diverse Workforce, Forbes

Our Young People

In2science summer programme

We supported **669 young people** from over **300 schools**





81% were from minority ethnic groups;

- 39% Asian or Asian British
- 24% Black, Black British, Caribbean or African
- 19% White
- 16% Other ethnicity
- 2% Prefer not to say

379 students (57%) were eligible for free school meals

555 (83%) have parents who did not have university degrees

357 (53%) participants at some point received **Pupil Premium, Education Maintenance Allowance** or the **16-19 Bursary**

95 (14%) have an Education Health Care Plan

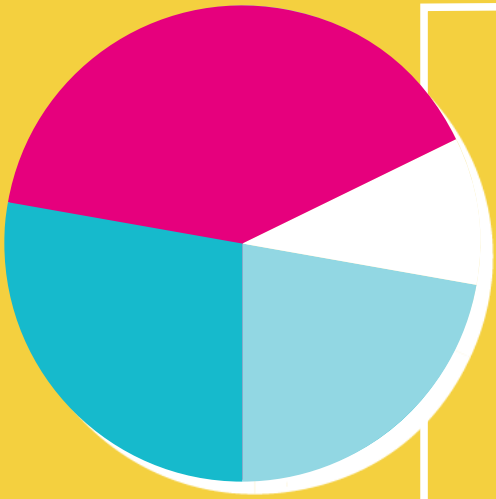
14 (2%) disclosed they are currently in or have been in care

Our Participants
In2research programme

We supported **50 participants** this year

72% Female

28% Male



90% were from minority ethnic groups ;

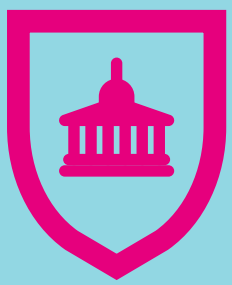
- 40% Asian or Asian British
- 28% Black, Black British, Caribbean or African
- 10% White
- 22% Other ethnicity

86% of our participants were from a **low income household**

72% of our participants were eligible for Free School Meals

58% met all three of these criteria

64% participants at some point received **Pupil Premium, Education Maintenance Allowance** or the **16-19 Bursary**



70% of participants were from Russell Group universities

30% from non-Russell Group universities

The role of increased science capital in raising social mobility

Science capital refers to what you know, who you know, how you think and what you do[2].

The more of it you have, the more likely you are to believe that 'science is for me' which can lead to engaging better as well as taking science education further.

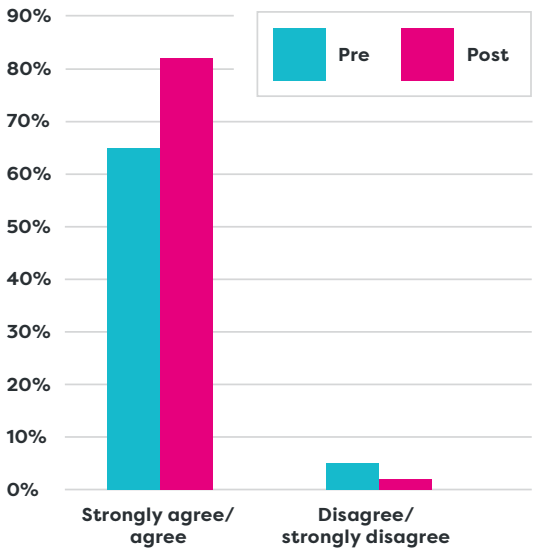
All of our programmes aim to increase science capital for our programme beneficiaries, so they are empowered to progress into careers in science, technology, engineering and maths.

87%
respondents reported feeling more confident after the programme

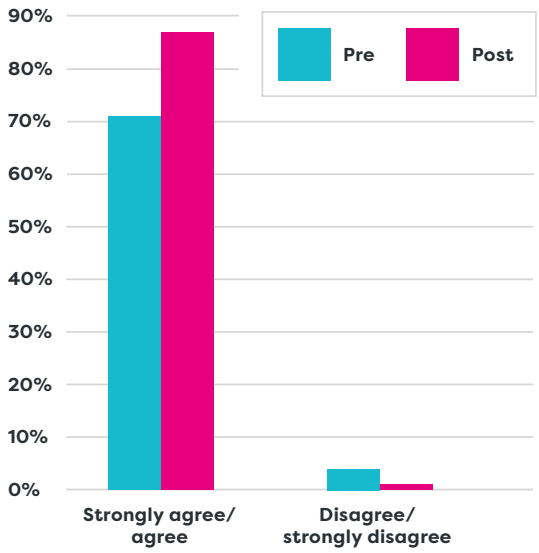
In2science summer Programme

Participants shared that their knowledge in STEM has significantly increased as a result of the programme (Figure 1) and furthermore, that their confidence grew around using scientific evidence to make an argument (Figure 2). 87% of respondents reported feeling more confident after the programme versus 71% pre-programme.

(Fig. 1)
'I know quite a lot about science, technology, engineering or maths'



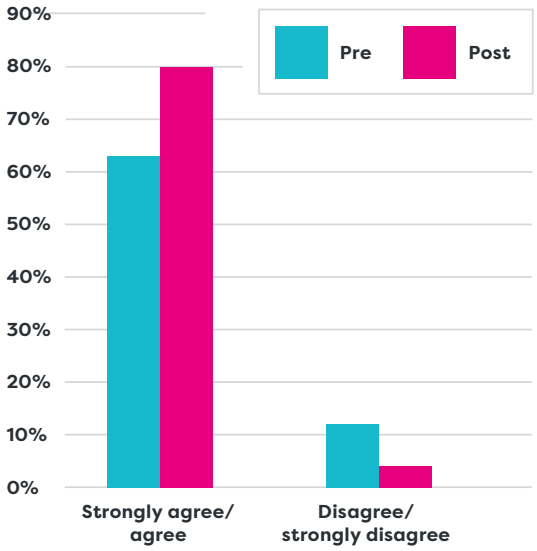
(Fig. 2)
'I feel confident about using scientific evidence to make an argument'



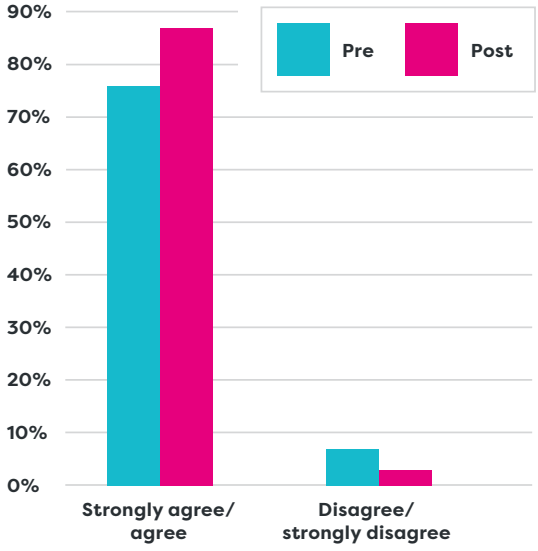
[2] Godec, S., King, H., & Archer, L (2017). The Science Capital Teaching Approach: engaging students with science, promoting social justice. London: University College London

Alongside a visible increase in 'what you know' for our participants, when it came to awareness and knowledge around STEM, we saw a rise in levels of confidence to engage with academics and professionals (Figures 3 and 4). 80% of young people post-programme felt confident engaging in-person with academics and professionals in STEM, compared to 63% pre-programme.

(Fig. 3)
'I feel confident introducing myself to a researcher or STEM professional in person'

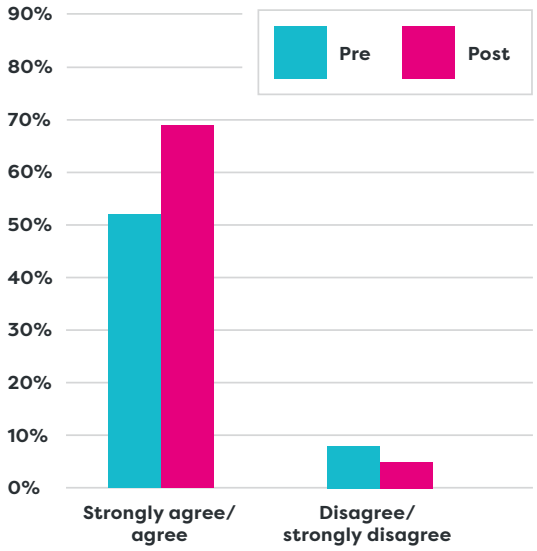


(Fig. 4)
'I feel confident introducing myself to a researcher or STEM professional by email'

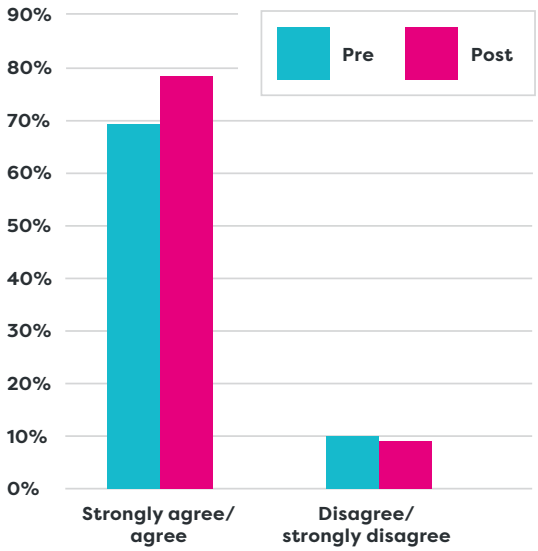


Positive shifts in 'how you think' were apparent for our programme participants when it came to how they identify with STEM studies and careers (see Figures 5 and 6). 69% of participants strongly agreed or agreed post-programme that 'people like me' work in STEM compared to just 52% pre-programme.

(Fig. 5)
'People like me work in STEM'



(Fig. 6)
'I think anyone can become a scientist, technologist, engineer or mathematician'



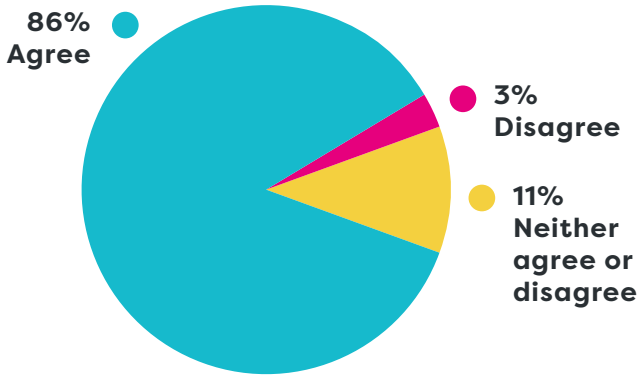
University Access

An understanding of the education and employment pathways, and being equipped with the core skills to enable access to them, is critical for young people to make informed decisions about their studies and careers.

Our data below provides a snapshot of how the summer programme helped our young people to gain knowledge and understanding of pathways available within STEM, as well as increased their confidence and ability in necessary, practical skills to access university.

(Fig. 7)

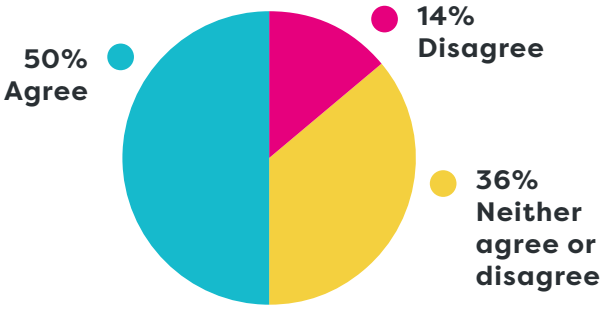
'The In2science summer programme has made me more sure of my career aspirations'



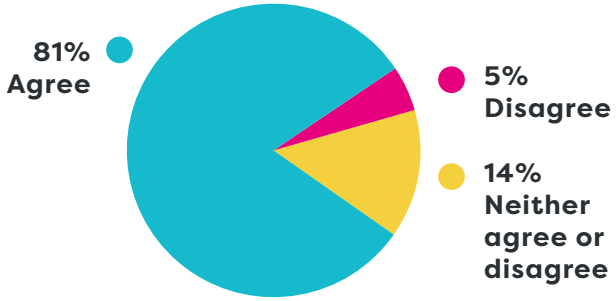
Overall, 86% of students reported that the programme made them more sure of their career aspirations, with 72% of respondents having drafted their personal statement for their UCAS application after the programme, versus 13% at the beginning of the programme.

(Fig. 8)

'I understand the content and structure of a range of STEM degrees'



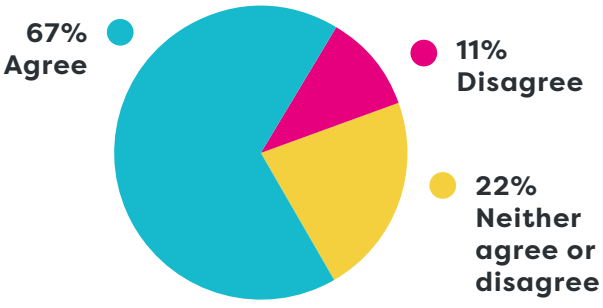
Pre-Programme



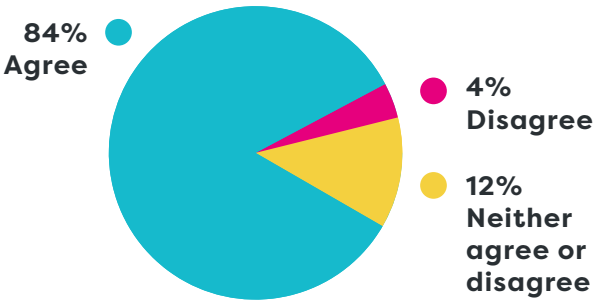
Post-Programme

(Fig. 9)

'I know a number of diverse careers I could enter with degree I am choosing'



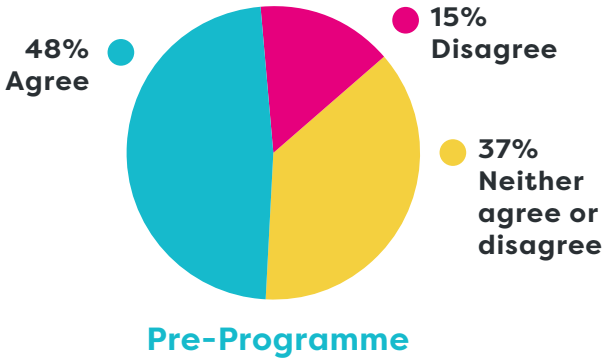
Pre-Programme



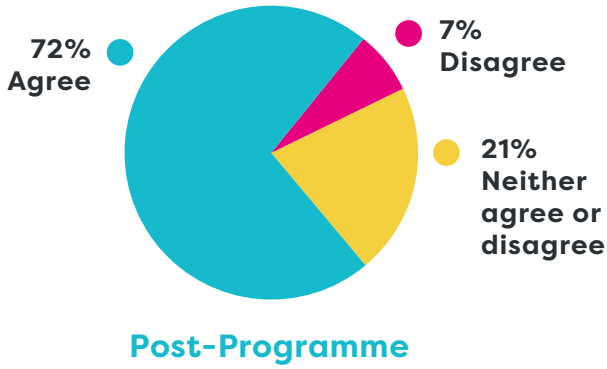
Post-Programme

(Fig. 10)

'I feel confident I can write a high quality UCAS statement'



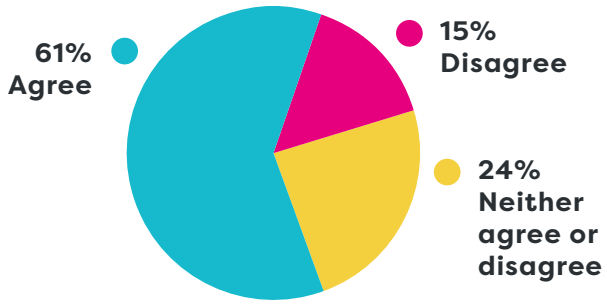
Pre-Programme



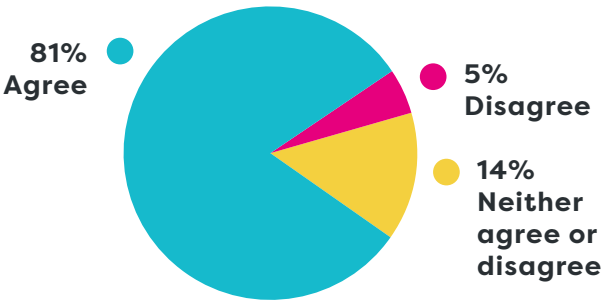
Post-Programme

(Fig. 11)

'I know where to seek support and advice about the application process'



Pre-Programme



Post-Programme

"I joined the In2science summer programme because I had no exposure to the STEM sector beforehand and wanted to gain more experience in the STEM side of study - the In2science summer programme gave me that, and more. For example, I had initially thought I wanted to be a doctor; as everyone knows what a doctor is or does, though not everyone knows what being a researcher is and what kinds of things they do. I now know that cancer research is an area I want to get into.

I completed a placement in biology at the Lab for Molecular Cell Biology at UCL. I got to use an electron microscope which is something I have always been really interested in. I even grew cancer cells in a lab and observed their growth over a week. Even though my placement was in biology, I also had the opportunity to mix with both physics and chemistry students at the university. My incredible mentor, a PhD researcher, really helped me get the hang of biology life at university. I loved my placement, this has really helped me make a decision with my future, I learnt so much. I am so happy I participated. Thank you, this has been a really positive experience for me!"

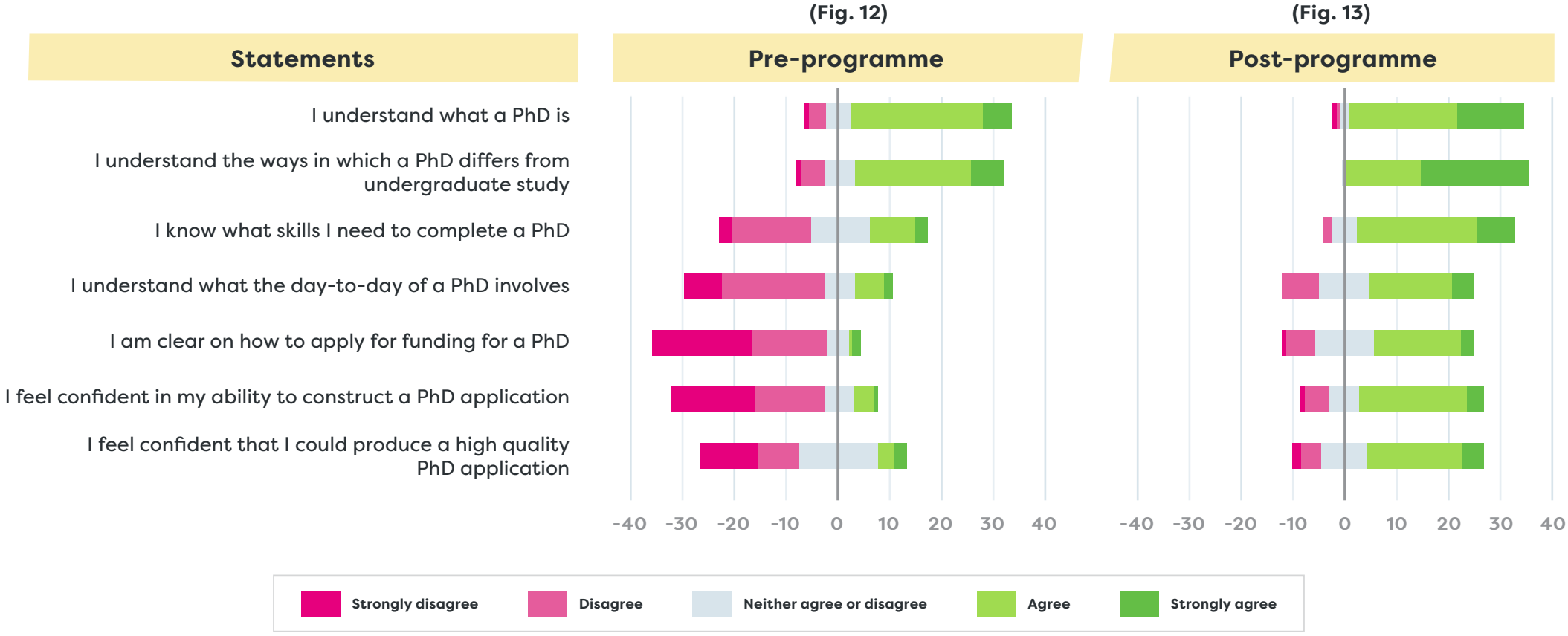
Hirah, In2science summer programme participant

In2research programme

Our In2research programme evidence suggests we are seeing improved access to postgraduate study and a bridging of the knowledge gap experienced by many people from disadvantaged backgrounds.

100% of participants on the In2research programme reported they strongly agree/agree that the In2research programme has improved their confidence in applying to, and ability to undertake, a PhD programme. 80% strongly agree/agree they will stay in contact with their placement host and research group after the programme. 13% of all participants were offered a job with the research groups where their placement was based after the programme and 4 participants, so far, have reported being accepted onto a PhD (9%), with 59% reporting they were in the process of applying for a PhD.

Figures 12 and 13 show a series of statements which In2research participants responded to before, during and after the In2research programme. Participants expressing negative sentiment (disagreeing or strongly disagreeing) are shown in **fuchsia**, whereas participants expressing positive sentiment (agreeing or strongly agreeing) are shown in **green**. Neutral answers are in **grey**. A visible, dramatic change in sentiment can be seen pre-programme compared to post-programme, with a clear increase in positive sentiments for all statements post-programme.



In2research programme - continued

(Fig. 12) (Fig. 13)

Case Study

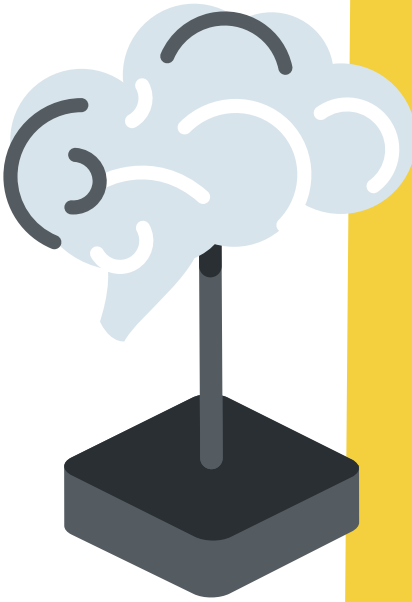
Sofia, In2research Programme

“

I am currently in my final undergraduate year studying Psychology. I applied for **In2research** because I wanted to do a clinical doctorate but I wasn't really aware of what a PhD was, how to apply for it, what it might be like. When I heard about this programme I thought it's a great opportunity for me to find out!

From the beginning, the In2research workshops and mentoring were great. I gained a lot from the workshops, covering useful topics like what a PhD is and is like, funding for PhDs, you learn how to write a CV, cover letter, interview, and more. The workshops prepare you for if you decide to apply for a PhD or postgraduate programme. My mentor was amazing too - it was great to get advice from a mentor within the same field I was interested in. She provided useful insight on what to expect from my final year at university and things I can do to support my grades.

My research placement was at Wellcome Centre for Neuroimaging at UCL, where I had the opportunity to work on predicting language outcomes after a stroke. The aim of the project is to create MAPS, which will allow future stroke patients to be told in earlier stages the recovery time and best treatment options. I learnt how to analyse brain lesions in CT scans, completed fMRI scans with participants, transcribing, and so much more. A personal highlight was seeing the structural MRI of my own brain!



My host and supervisor, in addition to a network of other people, taught me everything. Thanks to the supportive team, I never felt like I didn't know what to do. I want to do a clinical doctorate and this placement is helping me in the steps to get there. All the experience I am gaining in research and clinical studies will help me with my career progression. After my 8-week research placement I was offered a full-time job with Wellcome over the summer and they are supporting me to continue this role part-time, alongside university!

”

Our Volunteers

In2science summer programme

We are hugely grateful to all our volunteers who continue to play a crucial role in helping us deliver invaluable support for our beneficiaries.

This year:

252
volunteer hosts supported students on the summer programme

39
workshops were delivered to our young people with the support of 45 volunteers

"I hosted an In2scienceUK student in my lab for a week. It was incredibly rewarding to meet such an enthusiastic, intelligent, curious person and introduce them to neuroscience. In addition, the student contributed to ongoing experiments and the data is so good that it has gone straight into a manuscript with the student as a co-author!

Diversity is essential in research to ensure that we get as many possible perspectives. We work on dementia and this is a very tough problem to solve, we need to be sure that we have people from all backgrounds working on the research."

Professor Tara Spires-Jones, In2science summer host, University of Edinburgh

"I wanted to get involved in the In2scienceUK programme as I wanted to show the students how motivating it is to do research, how exciting it is to know that you are working on something that is yet unknown, and how satisfying it is when you get the results at the end of the experiments...when we open up STEM to people from diverse backgrounds, we allow the problems to be investigated by people with diverse perspectives and this can only be a benefit for science.

Through volunteering with In2scienceUK, I got better at communicating science to students without any prior experience, specifically talking about all the things you do when you are in the lab. I found it super rewarding seeing how the students progressed in the lab and got more confident in doing things."

Julie Nielsen, PhD student, The Francis Crick Institute

Our Volunteers
In2research programme

"The programme this year has been great. I feel it has been a win-win situation for me and my student (as a biologist I might describe it as perfectly symbiotic!). I've benefited from a boost to my career and research by enabling me to sharpen my teaching abilities, develop leadership skills and communicate clearly why my research is important. It has also been a joy to work with somebody so bright and enthusiastic who asks refreshingly great questions. In return, my student learnt a whole range of cutting edge lab techniques that will make her a more competitive student for any PhD applications and has gained valuable insight into a career as a researcher."

Dr Stephen Terry,
In2research Host at UCL Ear Institute

This year, approximately:

68
mentoring sessions were delivered thanks to our academic mentors

73
volunteer hosts, mentors and workshop facilitators helped us directly deliver the programme

50
hosts supported our participants through in-person, 8-week summer research placements

"Through the In2research programme, I was able to help participants develop essential professional skills by creating a safe and open space where they could hone these skills with constructive and supportive feedback. This programme broadened my understanding of the wealth of (often invisible) obstacles that many face when working toward a career in STEM. Most importantly, In2research encouraged me to reflect on my experience of privilege so far, and to think more deeply about how I can help to expose and break down those invisible barriers."

Dr Dezerae Cox,
In2research Mentor at University of Cambridge

Looking forward
2023 and beyond

89%
of summer programme participants found in-person placements to be the most enjoyable part of the programme

We will continue to build on our success and support more eligible young people across STEM subjects, through blended In2research and In2science summer programmes (delivered in-person and online) and the introduction of an entirely online In2science summer programme aiming to serve young people in rural areas across the UK. In 2023 we will continue working with our generous volunteers and funders to offer placements and workshops for our programme participants. 89% of all summer programme participants found their in-person placements to be the most enjoyable part of the programme this year. We will provide more high quality, in-person STEM placements than ever before, responding to the needs of our participants, as well as focus on growing our offer of placements in technology, engineering and mathematics.

We have a vibrant alumni community of STEM undergraduates, graduates and early career professionals. In 2022 we launched a new Alumni and Careers programme, which aims to provide alumni and young people at an early career stage with opportunities to develop their career in STEM. This will include mentoring opportunities, exclusive job and internship opportunities, an extensive knowledge bank, and tailored support packages from partners. There will also be monthly workshops and career panels to enable young people to seek their first steps into employment.

Our first alumni mentoring programme also kicked off this year. This programme, generously supported by The Charity of Sir Richard Whittington, offers peer-to-peer mentoring to young people starting university for the first time. In 2023, this program will be the first part of a broader mentoring offer that will grow year after year.

With our new 2023-28 strategy launching in early 2023, we are very excited about our plans to secure a future in which many more young people from disadvantaged backgrounds can achieve their full potential and progress into careers within science, technology, engineering and maths.

With thanks to our funders and partners

Abcam
Alan Hirze
Appleyard Lees
ARUK Scotland Network (Edinburgh group)
Avantor
Babraham Institute Cambridge
Biochemical Society
Blackfield
Cadent Foundation
Cancer Research
City University of London
Charity of Sir Richard Whittington
D Young & Co
Dr Leo James
EGA Institute for Women's Health
Eleanor Rathbone Charitable Trust
Institute for Epidemiology & Healthcare - Faculty of Population Health Sciences
Five Bees
Francis Crick Institute
Garfield Weston Foundation
Google DeepMind
GSK
Guarantors of Brain
Henry Royce Institute
HGF
Impellam
Innova Learning
Institute of Metabolism and Systems Research University of Birmingham
Institute of Neurology
Intelligent Conversation
IP Federation
IPEM Kingston University
Leading Routes
LiFT
MRC AIM DTP
MRC Brain Dynamic Network Unit (Oxford)
MRC LMB Cambridge
National Institute for Health Research Biomedical Research Centre University College London Hospital
NCR Foundation
OHG Group
Operational Research Society
Paul Hamlyn Foundation
People's Postcode Lottery
Playstation
Quintessa Ltd
Rangoonwala Foundation
Royal National Institute for Deaf People
Royal Academy of Engineering
Sainsbury Wellcome Centre
SEC Recruitment
Singular Talent
Springer Nature
Sekisui Diagnostics
Syneos Health UK
The James Dyson Foundation
The IP Federation
The Manly Trust
The OR Society
The Royal Society
TPXimpact (Panoply)
UCL Bartlett
UCL Birkbeck
MRC DTP
UCL Ear Institute
UCL Engineering Sciences Faculty
UCL Faculty of Arts & Humanities
UCL Faculty of Brain Sciences
UCL Faculty of Life Sciences
UCL Faculty of Population Health Sciences
UCL Faculty of Social & Historical Sciences
UCL Finance & Business Affairs
UCL Great Ormond St Institute of Child Health
UCL Institute of Health Informatics
UCL Institute of Education
UCL MAPS
UCL Faculty of Life Science Gatsby Computational Neuroscience Unit
UCL Academic Careers Office
UCL School of Pharmacy
UCL Widening Participation
UK Dementia Research Institute
University of Birmingham Institute of Applied Health Research
University of Birmingham School of Biomedical Sciences
University of Cambridge
University of Essex
University of Exeter
University of Leeds
University of Oxford
UPSIGN
Uptake Strategies
Wellcome ISSF
Wellcome Centre for Human Neuroimaging
Zopa

Thank you to all our other fantastic supporters.

Winning drawing by one of our participants

"My host Kirsty in her neurodevelopmental research lab."

by Marika, STEM Behind the Scenes Winner

Public engagement competitions are part of our In2science summer programme, supporting young people to develop tools to communicate effectively to different audiences, a key skill in many STEM careers. These competitions also give young people the opportunity to show off their talents!

To support us contact Colby Benari at colby@in2scienceuk.org
@in2scienceUK
in2scienceuk.org

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