

Written Evidence Submitted by In2scienceUK (DIV0080)

I write as Chair of the charity [In2scienceUK](#) whose mission is to promote social mobility and diversity in STEM. We do this by empowering young people from disadvantaged backgrounds to achieve their potential through life changing opportunities that give them insights into STEM careers and research and boost their skills and confidence.

For more than 10 years the charity has helped young people from disadvantaged backgrounds during the summer between Year 12 and Year 13 by running placements and workshops which mean that young people who lack “science capital”¹ in their family circumstances have the chance to meet STEM professionals. They get the opportunity to gain an insight into STEM careers as well as take part in practical experiments or work, read academic papers, attend seminars and receive mentoring. We also offer skills, employability and access workshops providing participant support and advice on areas like personal statements, CV writing, interview skills and student finance alongside information and advice about the breadth of and routes into STEM degrees, apprenticeships and careers. The success of our programme is validated statistically by UCAS STROBE who track In2scienceUK cohorts in the UCAS application system and compare their outcomes with a control group with similar defined characteristics. In 2021 we developed a new programme, [In2research](#), to address issues of disadvantage in accessing Postgraduate research opportunities.

Although our focus is on disadvantage as defined by factors such as: lack of parental university experience, free school meal eligibility and residence in deprived postcode areas, in practice 72% of the 670 students in our 2021 cohort were from BAME backgrounds, which is in itself an interesting reflection on the intersectionality here.

Our full impact evaluation is [here](#).

¹ Archer, L., Dawson, E., DeWitt, J., Seakins, A., & Wong, B. (2015a). “Science capital”: A conceptual, methodological, and empirical argument for extending bourdieusian notions of capital beyond the arts. *Journal of Research in Science Teaching*, 52(7), 922-948.

We are a small charity and lack capacity for significant policy engagement, however we hope you find useful the following insights based on our experience and what we know works.

• **the nature or extent to which women, ethnic minorities, people with disabilities and those from disadvantaged socioeconomic backgrounds are underrepresented in STEM in academia and industry;**

We don't have new national-level data here, however we do have information regarding the cohort of our programme, which may offer some insights into the degree of intersectionality between these factors. We attach this at Appendix One. If helpful it might be possible for us to undertake more specific analyses on request. It should be noted that these are the students who were at schools that we work with who were encouraged to apply and who had already chosen science A levels by that point; they are not necessarily a representative sample of the whole population of individuals who would benefit from support.

• **the reasons why these groups are underrepresented;**

Repeated messages we hear relate to:

- Sense of personal “fit”; students from areas and backgrounds with relatively low aspiration don't necessarily see STEM professionals as “people like me” and such individuals may not be within the family or friends groups of our students. This is why it is so vital that our programme includes contact with actual STEM professionals. In our 2021 programme following the completion of the programme there was a 20% increase in those who have met “a scientist, engineer, technologist or mathematician”. There was also an 11.8% increase in those who “strongly agreed” or “agreed” that “people who are like me work in science, technology, engineering and maths”.
- Accessing Higher Education, particularly to top universities where graduates are most likely to progress to science careers; prior to our interventions the young people in our cohort were asked questions about accessing higher education; the percentage who said they agreed or strongly agreed with:
 - Having confidence in writing UCAS statements was just 42% (75% afterwards)
 - Knowing where to find help and support: 54% (82% afterwards)
 - Understanding the content and structure of STEM degrees: 54% (87% afterwards)

The UCAS STROBE data for the 2020 In2scienceUK cohort showed that, as well as having statistically significantly more inclination to apply - and then again significantly more likely to be accepted a far greater proportion of In2scienceUK students applied to high tariff group universities than expected for the comparison group, and far fewer applied to the low tariff group (statistically, very significantly high and very significantly low respectively by

the STROBE report measure). This shows that student aspirations are increased following the In2scienceUK programme and suggests that the problems we solve are the right ones. Interventions of the type that we provide, more widely applied, would have a greater beneficial effect.

- Career development beyond a first STEM degree. Our alumni report that the cost of additional postgraduate qualifications (e.g. doing a Masters to qualify for PhD study) is an inhibiting factor for entering research, as is the lack of practical application support and role models. Anecdotally we fear that people from under-represented backgrounds are less able to “talk the talk” and be comfortable with the networking that can be taken for granted in applying for professional roles.

• **the implications of these groups being underrepresented in STEM roles in academia and industry;**

The APPG report has already described the extent of under-representation. It is hard to construct a counterfactual but our experience leads us to believe that underrepresentation means that:

- Failing to achieve the potential of a significant fraction of our population leads to an absence of attainable social mobility which mean that as a nation we are underplaying our hand economically in terms of earnings potential and also in terms of national productivity and the wider social benefits that come from a more science-educated and higher-earning population
- As Caroline Craido Perez demonstrated in her 2019 book “Invisible Women: Exposing Data Bias in a World Designed for Men”, professionals inevitably bring their own life experiences to bear in the work that they do and this can lead to inequities.

• **what has been done to address underrepresentation of particular groups in STEM roles;**

Here we will obviously draw your attention to the work that we have been successfully doing, but freely admit that we are far from having the scale fully to address even the part of the issue where we contribute. In 2021 we received over 1800 applications from students who were eligible for the In2scienceUK programme but we were only able to support 670 due to limited placements, funding and resources. This is a powerful motivation for our growth ambitions.

• **what could and should be done by the UK Government, UK Research and Innovation, other funding bodies, industry and academia to address the issues identified.**

We are growing rapidly as we demonstrate to funders and potential providers of placements the effectiveness and relevance of what we do, however we would

strongly encourage others to learn from our experience for even greater impact, faster. We carry each year the guilty knowledge of the people who applied to us and who were turned away. We would be eager to share our data and insights with you, to the extent that we are able to with our current resourcing. It is our intention, during 2022, to develop our capacity to engage at a policy level such as this, but we aren't yet able to do so as richly as the topic deserves.

Our main message - a positive one - is that intervention works; at least in this particular step in the chain of achieving true diversity in STEM, this is a tractable problem, with tremendous upside to addressing it.

Appendix One - 2021 Student participant demographic summary tables

The tables below show demographic data of all students who **participated** in the programme in 2021. These show a breakdown of gender, eligibility, ethnicity.

Gender					
Participant Breakdown	Total	Male	Female	Non-binary	Other
Birmingham	70	18	52	0	0
Bristol	17	5	12	0	0
Cambridge	15	5	10	0	0
Canterbury	0	0	0	0	0
Cardiff	8	1	7	0	0
Coventry	10	1	9	0	0
Exeter	15	3	12	0	0
Lancaster	2	1	1	0	0
Leeds	29	5	24	0	0
Liverpool	8	2	6	0	0
London	392	126	266	0	0
Lutterworth	0	0	0	0	0
Manchester	58	11	47	0	0
Oxford	33	9	23	1	0
Reading	3	1	2	0	0
Penryn	0	0	0	0	0
Warwick	0	0	0	0	0
Welwyn	0	0	0	0	0
Wolverhampton	10	3	7	0	0
Worcester	0	0	0	0	0
Other	0	0	0	0	0
Totals	670	191	478	1	0

This table represents the number of students that meet each eligibility criteria independently, with the exception of the values for “both FSM & no PHE”.

FSM = Free School Meals recipient, in year 11, sixth form or equivalent

No PHE = No Parental Higher Education **EHCP** = Education Healthcare plan

PP = Pupil Premium or Education Maintenance Allowance recipient

Criteria								
Participant Breakdown	FSM	No PHE	Both FSM & No PHE	PP	POLAR4 Q1	POLAR4 Q2	EHCP	Experience of Care
Birmingham	56	60	46	50	6	6	14	2
Bristol	5	17	5	3	8	4	0	0
Cambridge	3	13	1	4	0	2	2	1
Canterbury	0	0	0	0	0	0	0	0
Cardiff	1	6	1	3	1	2	1	0
Coventry	7	9	6	4	1	0	1	1
Exeter	4	11	3	9	0	1	0	1
Lancaster	1	2	1	1	0	0	0	0
Leeds	12	23	7	12	3	5	4	1
Liverpool	6	7	5	4	2	0	2	0
London	325	317	256	296	4	15	42	9
Lutterworth	0	0	0	0	0	0	0	0
Manchester	32	46	24	34	5	4	11	2
Oxford	8	27	6	13	6	0	6	0
Reading	2	3	2	3	0	0	0	1
Penryn	0	0	0	0	0	0	0	0
Warwick	0	0	0	0	0	0	0	0
Welwyn	0	0	0	0	0	0	0	0
W'hampton	6	8	5	8	1	3	1	0
Totals	468	549	368	444	37	42	84	18

Welwyn	0	0	0	0	0	0	0	0	0	0	0	0
Wolverhampton	2	1	2	1	0	0	2	1	0	0	1	10
Worcester	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Totals	121	123	58	35	47	47	53	91	39	37	19	670

Ethnicity		
Ethnicity	Tot	%
Any other ethnic group	23	3
Arab	34	5
Bangladeshi	95	14
Black African	139	21
Black Caribbean	12	2
Chinese	10	1
Indian	39	6
Mixed White and Asian	8	1
Mixed White and Black African	10	1
Mixed White and Black Caribbean	6	1
Other Asian background	39	6
Other Black background	11	2
Other Mixed/multiple ethnic background	14	2
Other White background	36	5
Pakistani	83	12
Prefer not to say	13	2
White British	98	15
White Gypsy or Irish Traveller	0	0
White Irish	0	0
Totals	670	100

(January 2022)