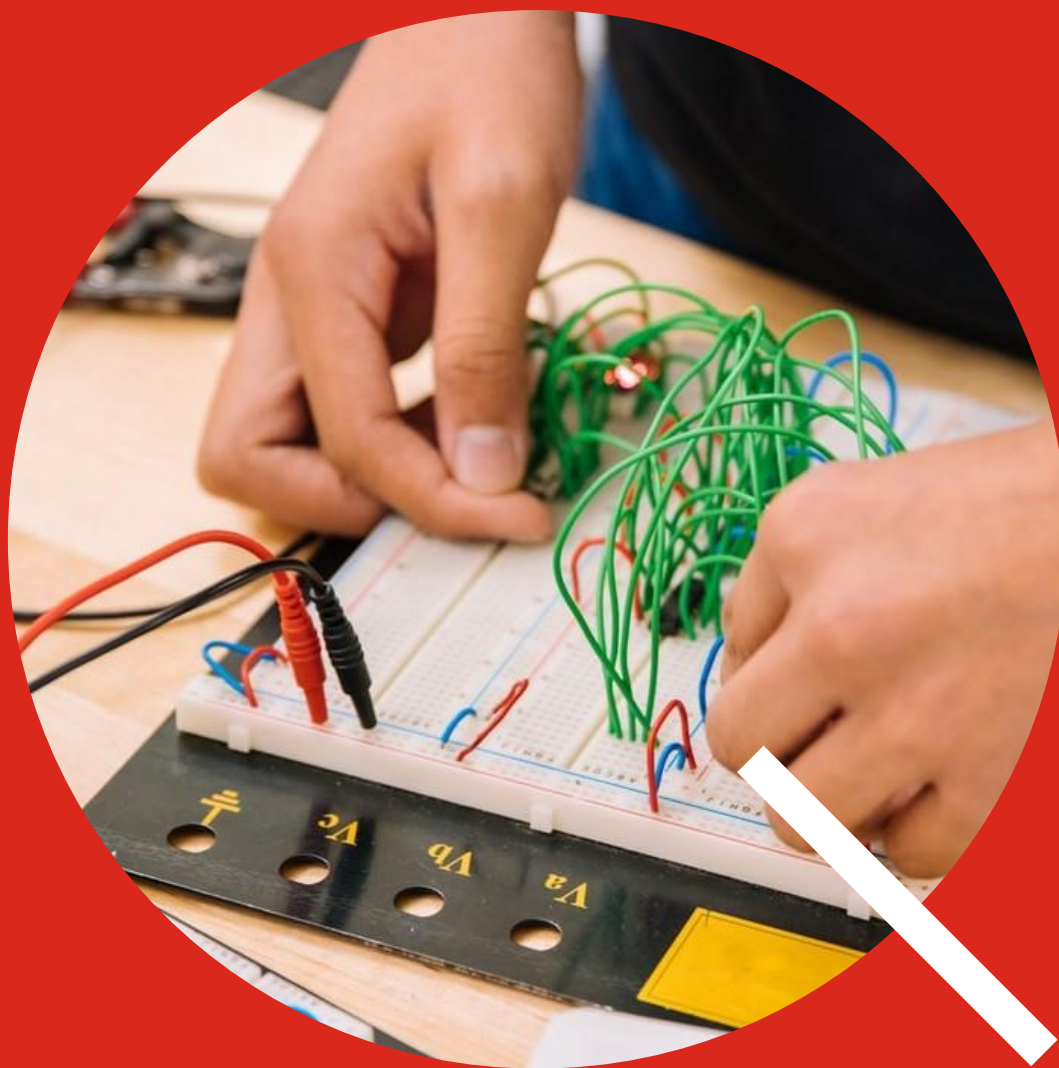


# STEM Ambassador Programme Review

A summary report for UKRI



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# 1. Introduction

## The STEM Ambassador programme

- 1.1** UK Research and Innovation's (UKRI) STEM Ambassador programme aims to provide engaging informal learning opportunities to young people of all backgrounds to support their understanding of STEM and encourage them to consider whether STEM could be 'for them'. The programme is managed by STEM Learning. It links STEM employers and people working in STEM jobs who act as role models by sharing their knowledge and career stories with young people in schools, colleges and non-school organisations, including youth and community groups. Ambassadors are volunteers who come from a range of STEM and STEM-related businesses and backgrounds. They are connected to young people via activity organisers some of whom are education-based (including Careers Leaders, teachers, tutors and employer liaison staff), while others run voluntary and community youth groups.

## The review

- 1.2** In summer 2021 UKRI commissioned a review of the STEM Ambassador programme. The purpose of the review was to improve understanding around the overall effectiveness of the programme against its aims and objectives, how the programme has impacted policy, process and activity within the STEM engagement sector, and the effectiveness of the governance and management of the programme at local and national levels.
- 1.3** Data collection for the review comprised four key components:
- Document and data review: annual reports to UKRI, samples of quarterly reports from all Hubs and other research documents were reviewed. An iterative process of interrogation of STEM Learning's dashboard data also informed the review
  - Interviews with key national stakeholders, the STEM Learning team, and Hub leads (five discussion groups were held with 18 participants from 16 of 17 Hubs)
  - Four locality-based case studies focussing on the organisation, delivery and impact of the STEM Ambassador programme in areas selected to explore a range of different contexts
  - Case studies of other volunteer programmes that deliver similar objectives to the STEM Ambassador programme in the UK and USA.
- 1.4** This is a summary of a full report. The full report includes further detail about programme performance, its operational characteristics, lessons from both the international and locality case studies and annexes with technical data regarding performance delivery and fieldwork insights.

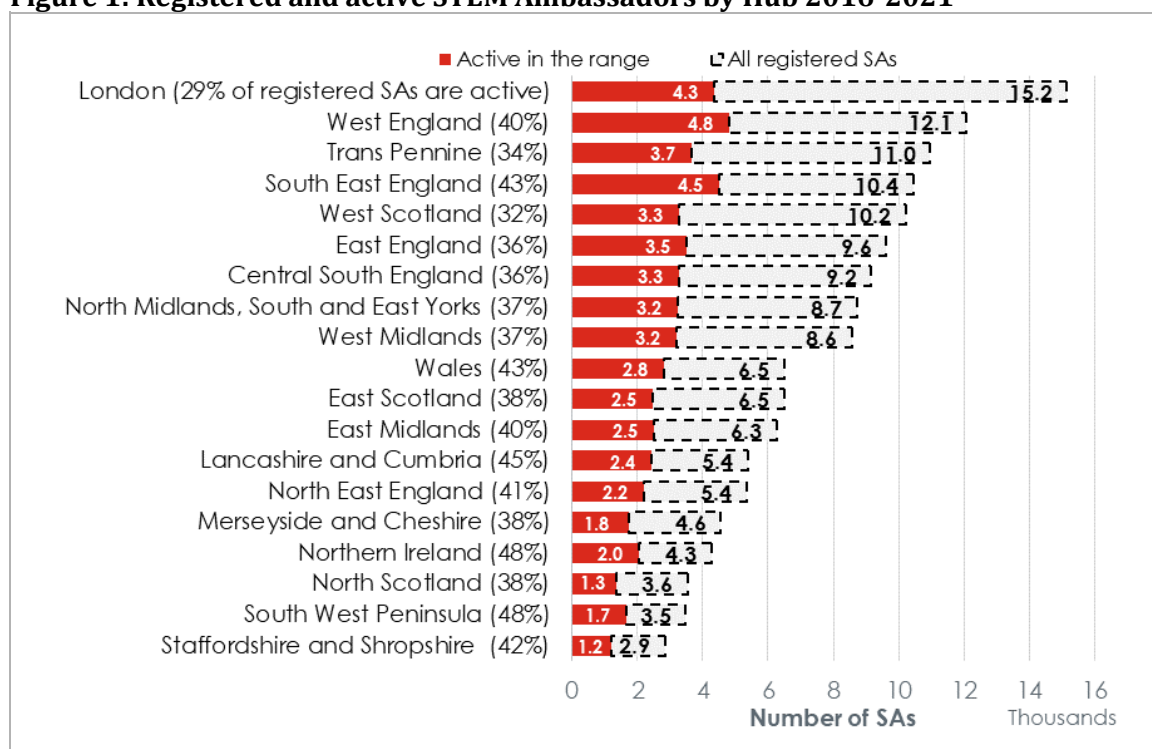
## 2. Findings and conclusions

### STEM Ambassador programme performance

#### Number of STEM Ambassadors

- 2.1** The STEM Ambassador programme delivers at scale across the UK, and has done so for a number of years. Between 2016 and 2021, 143k STEM Ambassadors were classed as ‘registered’, 38% of whom (54k) were ‘active’ at some point in this period. Numbers of Ambassadors vary between Hubs (Figure 1). The programme had been increasing the number of schools and colleges it engaged with year on year reaching 70% of all state-funded secondary schools in 2019/20. Since the pandemic these numbers have fallen but nevertheless the programme continued to engage with young people by redesigning their offer to transfer activities to digital platforms. There was an expectation that schools would return to demanding more face-to-face engagement activities in due course, but at the time of the evaluation fieldwork most schools, colleges and activity organisers were practicing social distancing measures that included limiting visitors.

**Figure 1: Registered and active STEM Ambassadors by Hub 2016-2021**



Source: SQW analysis of STEM Learning data

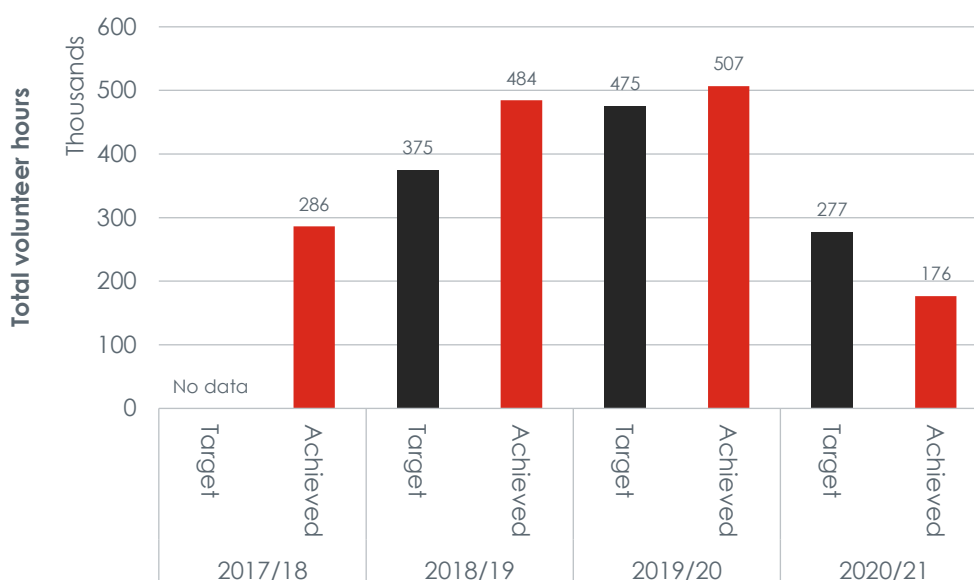
- 2.2** Ambassadors are a diverse group with higher proportions of females than are in the STEM workforce and with most being under 40 years of age. The ethnic backgrounds of Ambassadors reflects the wider population and the STEM workforce, but not the ethnic profile of younger age cohorts. In general the availability of Ambassadors is seen as sufficient

to meet needs, but some issues were reported in a) areas with low STEM activity, b) in remote areas that did not have coverage of sufficient STEM Ambassadors, and c) by activity providers who would like to have Ambassadors from their local area. This suggests an on-going need to target Ambassador recruitment to fill gaps and to diversify the Ambassador pool.

## STEM Ambassador reach

- 2.3** The data showed that the number of registered and active Ambassadors was declining but, perhaps more importantly, the number of hours being volunteered increased up to 2019/20 after which time the effects of the pandemic were observed in lower numbers of both (Figure 2). The increase in activity that was observed is encouraging.

**Figure 2: Delivery of targets relating to volunteer hours 2016/17 – 2021/22**



Source: SQW analysis of STEM Learning annual monitoring reports

- 2.4** The STEM Ambassador programme also has national targets for reach into schools and colleges. While activity and reach were increasing pre-Covid, these targets have not been reached since 2018 (Table 1). The target for secondary schools is much higher, at 80% of all schools, but in the last three years performance has not exceeded 70%. The primary school target is much lower, at 26%, reflecting that the programme started in secondaries and that there are many more primaries. While the targets set are as a percentage of schools in a Hub area, the number of primary schools reached by the programme exceeds the number of secondary schools. Performance against primary school targets is much closer to target, just a couple of percentage points adrift.
- 2.5** The programme expects at least one STEM Ambassador engagement in 95% of Priority Schools (defined using a combination of Department for Education criteria). Priority schools are those that are located in challenging areas or where achievement in science is less than it should be. The data shows that a lot of Priority Schools remain disengaged. Some Hubs reach

a much higher proportion of their Priority Schools than others: the difference between the lowest and highest performing Hubs on this measure was 34% compared with 74%. In 2020/21, 1,066 STEM Ambassadors delivered activities in 1,319 Priority Schools, which represents 54% of Priority Schools of all school types - although pre-Covid-19 this was at 76% in 2018/19. Even this better figure suggests a performance shortfall of around one quarter.

**Table 1: Targets and actuals reported reach of STEM Ambassador programme**

	Target	Actual % reached			
	% of organisations	2018-19	2019-20*	2020-21	Priority schools 2020-21
Primary	26	19	25	23	30
Secondary	80	60	70	59	73
College	70	61	63	61	n/a
Non-school **			71	85	

*Source: STEM Learning digital platform.*

*\* target calculation based on 20-21 targets, but these were adjusted (downwards) in Sept 20 to reflect effect of Covid-19. This column may therefore overstate the actual targets.*

*\*\*For non-school settings the table shows targets set for the proportion of volunteer hours as the number of organisations or groups is unknown.*

- 2.6** In terms of satisfaction, education-based activity organisers rated the quality of their experience with the STEM Ambassador programme highly. Across all measures, feedback was on average rated at least 4 out of 5.

## Programme oversight and delivery infrastructure

### STEM Ambassador brand awareness

- 2.7** The STEM Ambassador programme is one of many that seeks to connect young people with engaging insights into science mediated through a volunteer workforce. There are hundreds of other programmes and projects that schools, colleges and community groups can connect with. This landscape is also changing, not least for example with the emergence of Careers Hubs and trained and supported Careers Leads with volunteer 'Enterprise Advisers' in secondary schools.
- 2.8** In this crowded landscape the STEM Ambassador programme has high brand awareness – it is well known and well respected. This comes from its longevity, alongside having maintained good relationships with strategic partners at national level (through STEM Learning) and locally and regionally (through Hub activity).

### National infrastructure – local networks

- 2.9** The national programme, with robust national infrastructure, helps to reduce duplication and inefficiency by connecting with other national programmes, for example to align STEM

Ambassadors to support the delivery of CREST Awards. The co-ordination of STEM Ambassadors alongside other programmes by STEM Learning also creates efficiencies.

- 2.10** A national programme also creates efficiencies and a way to embed and develop quality. Tools and resources that can be used by STEM Ambassadors for different groups of young people to achieve different objectives can be hosted and shared nationally. Training of STEM Ambassadors can also be delivered at scale through the national infrastructure as can maintenance of DBS check information. IT systems to capture and handle data can benefit from national standardisation.
- 2.11** The STEM Ambassador programme aligns the strengths of a national programme with connected local and regional delivery. The Hubs vary in scale and experience. They bring a number of critical strengths to enable the national programme to work in local areas. The Hubs are often managed and run by people who are very well connected with schools, colleges, employers and local skills infrastructures in their areas. This set of local, personal relationships means that they can align their programmes with local projects and priorities.
- 2.12** However, the Hubs did report that the resources available to them through the STEM Ambassador programme are stretched. Over time expectations have changed and been added to around new approaches, innovation and wider engagement, but the requirement to operate the core programme has remained. Contracts have been renewed annually, but resources have remained fixed throughout this period.
- 2.13** Hubs needed to be able to connect with actions and strategic plans being made locally (for example Skills and Enterprise Strategies). In this sense the geographic coverage of the Hub should be at a scale that connects with other local strategic networks. However, the current patchwork nature of skills strategies makes this inherently challenging. In this context having a local Hub model which can engage at different levels is important, including the Regional Network Leads who are able to provide a view across several Hubs.
- 2.14** In performance terms, the review was not able to determine any relationship between the size of a Hub, number of schools and colleges covered, and its performance. This relationship is doubtless complicated by many other factors including the data issues described above, the time that the Hub and its staff have been in place and local context.

## **Performance management and reporting systems**

- 2.15** The programme has delivered a national scale programme, consistently with multiple examples of repeat use of the programme by employers and activity organisers throughout the UK. Its operating model has a range of mechanisms to manage performance. These include monitoring activity through the dashboard, setting and reviewing action plans, and a regional reporting structure in England, with Hubs directly reporting to STEM Learning in Northern Ireland, Scotland and Wales.

## Digital platform and data dashboard

- 2.16** Data about STEM Ambassador activity is held in a digital platform which is managed by staff at STEM Learning. The dashboard provides real time functionality with reporting capabilities. The design of the data system and GDPR considerations do however limit how the data can be used to manage performance. Its reliance on volunteer inputs means there may be gaps in what is reported and there is often a time lag between an activity and its reporting. This is probably inevitable.
- 2.17** More substantively, looking forward, is that it is better at reporting what STEM Ambassadors say they do, rather than how and to what extent organisations and young people engage with the programme and whether needs are met. For example, there is a widely held view that repeated, sustained engagement is more impactful, but the system is not able to report where this occurs.

## Key performance indicators and reporting systems

- 2.18** UKRI has agreed 15 aims and objectives for the STEM Ambassador programme which inform its grant agreement with STEM Learning. There are two sets of KPIs linked to contracted delivery. These relate to number of volunteer hours and satisfaction with the programme expressed by activity organisers and STEM Ambassadors. STEM Ambassadors submit the number of hours they volunteer preparing and delivering activities through the digital platform. Activity organisers are asked to provide scores out of 5 against a set of criteria that include enjoyment and satisfaction with the intervention, its contribution to learning objectives and achievement of links with the wider community. There are then a set of other metrics (some of which have target expectations) that provide a monitor of progress.
- 2.19** The KPIs themselves do not cover the range of aims and objectives of the STEM Ambassador programme and the review heard a widely held view that they needed to be revised to better reflect the achievements of the programme.
- 2.20** The reporting systems used between Hubs and STEM Learning, and then between STEM Learning and UKRI require extensive written reports. This includes the use of KPIs and RAG ratings. However, despite the effort that clearly goes in to assembling these reports, the review was struck by:
- The changes in structures making it difficult to build a picture over time
  - Key lessons, risks and priorities becoming lost in the volume of paperwork
  - A lack of consistency in reporting with numerical achievement of KPIs or RAG assessments not then being explained or discussed in reports
  - The focus of reports to UKRI being on overall programme performance. While this is understandable as a core focus it was noticeable that differences between the effectiveness and quality of provision between Hubs was not covered in standard reports.



## Programme delivery

### Types of STEM Ambassador activity

- 2.21** The STEM Ambassador programme impacts upon young people's science knowledge and skills in a range of different ways. The programme serves young people at different ages in both primary and secondary schools and through a range of activities. Four activity categories account for over 60% of all activities reported (these are 'Hands on practicals', 'STEM careers talks and / or advice', 'Mentoring or support', and 'Support an exhibition or event'. Most of this activity is done in educational settings (86% of all Ambassador time), and mostly in secondary schools. In total, between 2016 to 2021, it is estimated that STEM Ambassadors delivered over 181k activities, engaging between 15.2m – 25.7m young people.
- 2.22** There is a different mix of activities in Priority Schools. Compared to the most common activities delivered in all settings, 'Hands on practicals' are no longer present in the top five most common activities in Priority Schools. Also, 'Mentoring' and 'Professional development of educators' are notably more common in Priority Schools.

### Activity in Priority Schools

- 2.23** The review found limited discussion about Priority Schools when more would have been expected given the focus of the programme on reaching disadvantaged young people. These schools have been identified because they are listed as Priority Schools by the Department for Education for educational programmes (not including STEM Ambassadors). It seems counterintuitive to have a list of Priority Schools but requiring nothing different for those schools. The programme simply monitors the expectation that there will be a single STEM Ambassador activity in a higher proportion of Priority Schools compared with others. Priority schools may have specific challenges and may be harder to engage than other schools. They may therefore need an approach that is specifically tailored to their needs. The evidence that a different mix of activities occurs in Priority Schools compared with other schools also suggests that a tailored response would be useful. The STEM Ambassador Programme should consider how best to meet the needs of Priority Schools, both by identifying what those needs are (and how they might be different to other schools), and what additional support or resources STEM Ambassadors need to respond to those needs.
- 2.24** That said, evaluation of the impact of the programme on young people is recognised as very challenging but has not been fully realised. Challenges are associated with resourcing data collection (e.g. staff time needed to take registers or distribute and collect feedback surveys), and with attribution (because young people's choices are affected by a very wide range of factors in which the STEM Ambassador programme plays a small part). A STEM Learning evaluation tool to capture young people's feedback is used and reported in Hub reports occasionally, but this is not typical. This area requires further consideration around what is important to measure and achievable at reasonable cost.

**2.25** The Covid-19 pandemic has clearly impacted on the programme, with:

- A reduction in the demand for STEM Ambassador time, as schools have closed and faced wider challenges
- A shift to online delivery, which created a need for different types of engagement and activities
- The number of new Ambassadors registering in 2020 was lower than in previous years
- Hubs reported that some Ambassadors were able to offer volunteering hours to reach schools and colleges digitally that were otherwise inaccessible to them, while other Ambassadors were not able or did not want to engage in digital delivery
- Programme managers sought to increase work in informal settings (for example offering activities to groups that met outdoors) to compensate for lost activities in educational settings
- Delivery teams suffered illness and disruption themselves during this period.

**2.26** Many of these changes are likely to continue into the future. Digital delivery is likely to remain and will provide some advantages around accessibility. However, there was also an expectation of moving substantial amount of STEM Ambassador activity back to more traditional delivery methods.

## 3. Future programme options

- 3.1** The review of STEM Ambassadors was commissioned to provide reflections on its delivery with specific reference to overall performance, the role of Hubs, what it adds to STEM infrastructure and what the future options for the programme might be. This section provides a set of recommendations based on reflections around recent programme delivery, followed by consideration of different strategic options that might be considered as the next stage for the programme. The section starts by revisiting the aims associated with the STEM Ambassador programme as this sets important context for the consideration of future actions.

### Programme rationale and aims

- 3.2** The STEM Ambassador programme does not have a current written rationale to provide the policy context. In the past the prevailing narrative was around the pipeline of STEM skills through the education system and into the workplace. Policy narrative indicated that there were insufficient people with suitable skills available to STEM employers. One solution was to increase the number of people entering that skills pipeline. This is the rationale presented in the IFF evaluation research undertaken for BEIS which places the programme in the context of skills shortages and skills gaps:

*‘To sustain the future economy, investment in the future workforce will be vital to economic success, requiring early interventions to encourage and inspire young people to pursue STEM (or even STEAM more widely) subjects in school, through university and as a career’.*

**IFF Research (2019) STEM Ambassadors Evaluation Report p.1.**

- 3.3** The move from BEIS to UKRI has prompted a re-appraisal of the programme and how it might fit with UKRI organisational mission. Part of this is public engagement with science, arts and humanities. The STEM Ambassador programme is the largest component of UKRI’s public engagement investments and this strategy is itself also under review. Going forward, a clear rationale for the programme is needed.
- 3.4** The programme has a set of aims that are understood by its stakeholders to be a combination of careers information and science inspiration, to make informed subject and career decisions and to help young people engage with STEM regardless of their future career choice. These were understood by all the stakeholders that participated in the review from national stakeholders to those that contributed to the locality case studies.
- 3.5** UKRI have developed a set of 15 aims and objectives that shape their grant agreement with STEM Learning. One of these 15 is to use feedback to inform the evaluation and apply learning to improve future activities. The evaluation framework used by STEM Learning is based on a framework developed for BEIS that uses a somewhat different set of aims for the programme. STEM Ambassador programme aims should be consistently and clearly communicated by key stakeholders to ensure a consistent focus on achieving its purpose.

- 3.6** The aims and objectives of the STEM Ambassador programme are very broad. This creates opportunities for experimentation and for Hubs to focus on priorities that are relevant to their locality. However having a broad range of aims and objectives can also create challenges in meeting them all and identifying priorities (how important is it that the STEM Ambassador programme engage young people from disadvantaged backgrounds? How important is it that Ambassadors come from a diverse range of employers? Does it matter if the programme raises awareness but not the attractiveness of STEM careers?).

### Future options

- 3.7** The review considered the operation of the STEM Ambassador programme and the extent to which it achieved its objectives. It also considered future options for the development of the programme but was not commissioned to test options with delivery teams or other stakeholders.
- 3.8** The review did not consider a cessation of the STEM Ambassador programme because its systems and checks are recognised to add value. Neither did it consider de-nationalisation because UKRI's remit covers all four nations.
- 3.9** All the options require a period of strategic reflection to define the nature of the public problems that the STEM Ambassador programme can address on behalf of UKRI. We recommend that a short review be undertaken to articulate the rationale for the programme in the context of it being a UKRI programme and how if at all this should link to UKRI's public engagement strategy. Fundamental questions need to be addressed and conclusions clearly stated or re-stated. These include two fundamental choices both of which imply decisions regarding targeting:
- Is the STEM Ambassador programme primarily about ensuring young people are aware of the career options that continued STEM study make available to them? Or is it primarily about nurturing a future generation who are passionate about research and innovation i.e. linking with UKRI's public engagement strategy? These are not mutually exclusive questions but is a matter of emphasis. The answer to this question will affect the type of engagement activities that STEM Ambassadors prioritise.
  - Is the STEM Ambassador programme universal such that every school or college or community organisation that wants or needs an Ambassador gets one? Or, it is a programme which specifically targets those places or people who come from disadvantaged backgrounds and / or have low science capital? Again, this is not necessarily a dichotomy – a programme can be universal but with more intensive or more specific support for targeted groups. The answer to this question does however affect the number of organisations that STEM Ambassadors engage with and the scale of its interventions.

## Re-framing programme aims

**3.10** The review primarily considered operational improvements to achieve current aims and objectives. In doing so it raises questions around whether those aims and objectives should remain the same for the future. This section therefore presents a way to think about a more fundamental re-framing of the STEM Ambassador programme.

**3.11** The four aims for the programme as set in the review's terms of reference were:

- To increase young peoples' engagement with STEM subjects, especially those from disadvantaged backgrounds
- To raise awareness amongst young people of the wide range of careers opened up to them by studying STEM at school
- To build and strengthen relationships with employers to support increased engagement with the Programme
- To recruit and deploy STEM Ambassadors from a diverse range of employers, ensuring a wide range of STEM sectors and careers are represented.

**3.12** The first two aims define the purpose of the programme. The second two aims describe ways in which that purpose will be achieved – they are 'how' rather than 'what' and could apply equally to Aim 1 as Aim 2.

**3.13** The review has therefore considered whether the programme could be reframed either as *primarily* a STEM engagement programme or as *primarily* a careers information programme as a way to explore how refining the aims might impact on programme scale and activities. This is not meant to imply that the programme should only deliver one or the other aim but it is important to explore how they are different, and how the STEM Ambassador programme might be structured to ensure it achieves its aims.

## Increase engagement with STEM subjects

**3.14** The first aim is to increase young people's engagement with STEM subjects, especially those young people from disadvantaged backgrounds. The rationale for this aim would lie in the notion of science capital<sup>1</sup>. Science capital is accumulated as young people learn about science (and STEM) through family interactions, exposure to media and literature, and to extra-curricula activities such they assume that science is 'for them'. There is an equity perspective to science capital as it is associated with young people who have more resources, more family support. A lack of science capital can be associated with economically deprivation although it is by no means exclusively experienced by young people from these backgrounds.

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<sup>1</sup> The concept of science capital was explored in the ASPIRES research programme: Archer Ker, L, Osborne, JF, Dillon, JS, DeWitt, J, Willis, B & Wong, B (2013), Interim Research Summary, ASPIRES Project: What shapes children's science and career aspirations age 10-13? King's College London.

**3.15** The aims of science engagement interventions, including those that seek to build science capital are varied but include:

- increasing the supply of STEM skills to help the country to meet its pressing need for a sufficient number of highly skilled STEM professionals to meet economic goals and societal challenges.
- building STEM literacy to enable people to participate actively in society and make informed decisions
- positive outcomes for disadvantaged young people whose lives can be transformed as they aspire to STEM-related educational and professional trajectories<sup>2</sup>

**3.16** A programme that sought to increase engagement with STEM subjects might have a range of key characteristics. For example:

- It would not necessarily be a universal offer as there is an expectation of targeting
- It would be important to ensure engagement across all STEM subjects (biology, physics, chemistry, maths, computing and design and technology). An offer closely linked to the core curriculum alongside enrichment and extension type activities might be useful for schools and colleges
- The offer would need to be differentiated by Key Stage to ensure it was appropriate to the needs of different groups of learners and different curricula
- STEM Ambassador interventions would include hands-on practical, and applied theory approaches and training and support resources would focus on ensuring they had the skills and support to deliver such inputs.
- The programme would primarily be connecting with science and maths teachers.
- The programme could be appropriate for pupils in primary schools and for informal settings
- Employers would be asked to engage on the basis of the application of STEM knowledge in their business or industry.
- The need to ensure that the STEM Ambassador workforce represent the community they serve in terms of equality and diversity and inclusion characteristics remains important.

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<sup>2</sup> Godec, S. and Archer, L. (2021) Informing UKRI's STEM Inspiration and Youth Engagement work. UKRI (unpublished).

### Raise awareness of the wide range of STEM-enabled careers

**3.17** Alternatively, a programme could focus on the second aim, to ensure that young people are aware of the range of careers that are open to them if they continue their STEM studies. This aim has clear resonance with the Government Careers Strategy<sup>3</sup> with is underpinned by the Gatsby benchmarks. All state schools and colleges have a statutory obligation to implement the strategy. The Careers and Enterprise Company is funded by government to support them to do so with strategic partnerships with the LEPs, a regional network of staff, training, and support for nominated ‘Careers Leads’ in each school. The rationale for a careers-focused STEM Ambassador strategy would be to address the issues that accompany inadequate careers knowledge such as thinking that STEM careers to be ‘not for me’, to discourage stereotypical thinking, and address the knowledge gaps that exist around STEM-led educational and career pathways – including technical education.

**3.18** A programme that sought to raise awareness amongst young people of the wide range of careers that available following STEM study might have a range of key characteristics. For example:

- The Careers Strategy is for all young people so it would be challenging to make a case for a programme being targeted to only some young people
- Schools and colleges understand the Gatsby benchmarks and this, along with it being a statutory obligation, create an environment where links with employers are valued by schools and colleges
- It would be important to ensure that a wide range of careers were well represented, including industries that rely on STEM skills (engineering, manufacturing, computing) and those where STEM skills are valued transferrable skills
- Any programme would need to be carefully constructed to offer effective career-related learning in primary schools that helped children to understand ‘who they could become and helping them to develop a healthy sense of self’<sup>4</sup>
- The programme would primarily be connecting with science and maths teachers
- The offer would be differentiated by key stages to reflect the points in their educational careers when young people make their GCSE subject choices and then their 18+ destination choices
- The programme would primarily be connecting with nominated Careers Leads

<sup>3</sup> Department for Education (2017) Careers strategy: making the most of everyone’s skills and talents. <https://www.gov.uk/government/publications/careers-strategy-making-the-most-of-everyones-skills-and-talents>

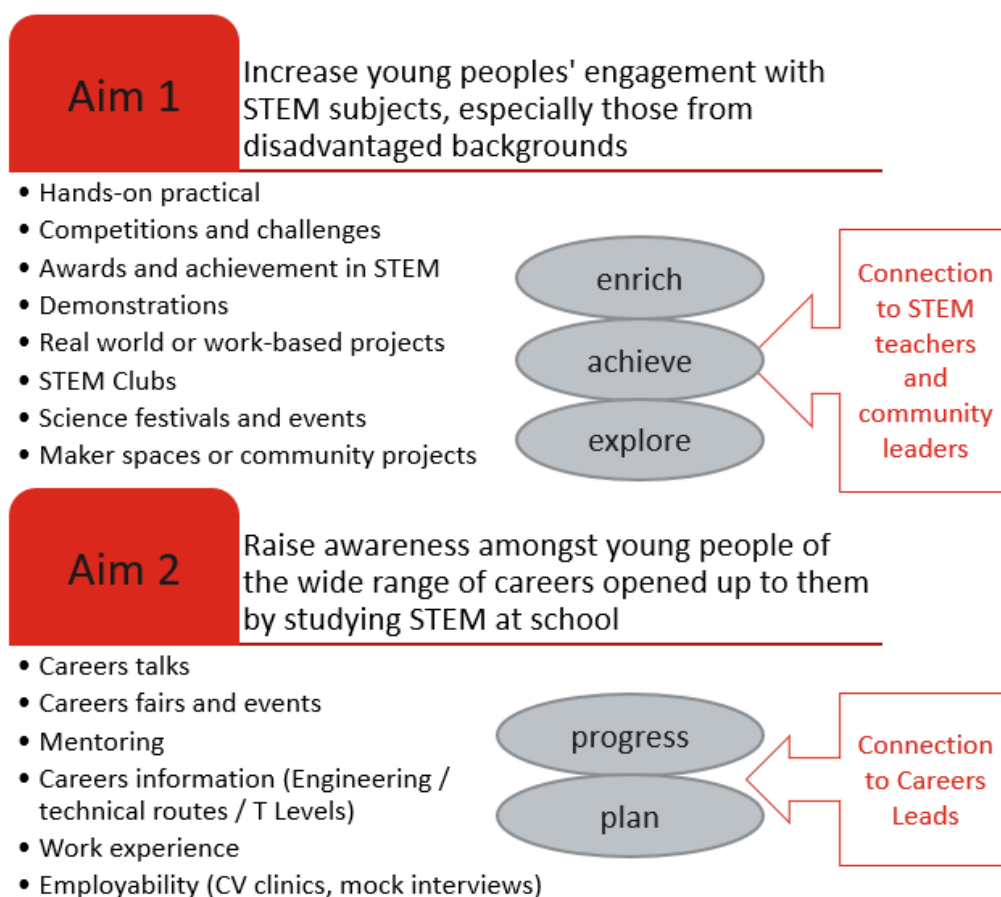
<sup>4</sup> Kashefpakdel, E. Rehill, J. and Hughes, D. (2018) What works? Career-related learning in primary schools. The Careers and Enterprise Company. <https://www.careersandenterprise.co.uk/media/m42pwir3/what-works-in-primary.pdf>

- Employers would be asked to engage to help raise careers awareness, enhance employability of young people and mentor them in their applications
- The need to ensure that the STEM Ambassador workforce represent the community they serve in terms of equality and diversity and inclusion characteristics remains important.

**3.19** Figure 3 summarises the types of activity that might be associated with each ‘aim’, and who the connectors would be. The purpose of the first aim (to increase engagement with STEM), would be to encourage young people to explore scientific ideas, to enrich and contextualise their experience of the curriculum, to build their knowledge and skills to help them in adult life, achieve examinations outcomes and through all of these help achieve their potential. The purpose of the second aim (to raise career awareness) would be to help young people to make informed career plans and to ensure clear progress through their education experiences.

**3.20** We recommend that UKRI undertake a discussion of these questions informed by conversations with other stakeholders from both the STEM engagement community and the career guidance community.

**Figure 3: Summary of strategic options**



Source: SQW



## 4. Recommendations for operational improvements

- 4.1** Notwithstanding the need to address fundamental questions about priority aims, the review was tasked with making a series of recommendations relevant to recent periods of delivery. In this section we make a set of recommendations relevant to infrastructure, delivery and performance.
- 4.2 Review communications and feedback mechanisms to create communication loops between UKRI, STEM Learning and Hubs.** The Hub managers had a strong relationship with STEM Learning but appeared to be more distant to UKRI. A clearer line of communication from UKRI via STEM Learning to operational teams should be considered so that Hubs can share their successes and key issues at a strategic level and so that UKRI can articulate their vision and share developments with operational teams. The Hubs provide feedback from their clients to STEM Learning and this is reported upwards. However, there is no formal mechanism for STEM Learning to capture feedback from Hubs regarding the national activities that they run. We recommend that UKRI instigate stronger feedback mechanisms that involve occasional meetings with Hubs.
- 4.3 Review whether demand for STEM Ambassador activity fits the supply of STEM Ambassadors by geography, characteristics and scale.** The more Ambassadors are available the greater the chance that someone will be able to fulfil a request for an activity. While large numbers of Ambassadors are in place it was not possible to say whether this was sufficient to meet demand or to undertake more proactive work to create demand. STEM Learning suggested that one way to explore this would be to examine requests for activity going unfilled. Further investigation into the scale and nature of any such gaps would be helpful. In addition, while personal characteristics of Ambassadors are recorded this does not provide a profile of their usefulness with respect to STEM skill, job role or sector. These would also be useful to capture. We recommend that a pilot exploration of gaps and profiles be undertaken in a small number of Hubs to ascertain the viability and utility of such an exercise nationally.
- 4.4 Encourage engagement with other national and local networks to connect skills and careers stakeholders at both national and local level.** The locality case studies showed that some LEPs were very active in encouraging education and employer partnerships while others were less so. Similarly, some LEPs have invested significantly into supporting Careers Hubs with the Careers and Enterprise Company while others have their own structures or have been slower to engage. There is a growing network of Careers Hubs that have formal links with named schools, place volunteers into those schools so that they can advise on ways to engage with employers and provide training opportunities<sup>5</sup>). We recommend exploring

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<sup>5</sup> SQW (2020) Enterprise Adviser Network and Careers Hubs Evaluation Report prepared for The Careers and Enterprise Company.

potential for more consistent closer working relationships with LEP skills teams and Careers Hubs at both national and local level.

- 4.5 Maintain the number of Hubs to provide stability but commit to a review once programme rationale and aims have been resolved.** Delivery in Scotland was recently rationalised from three Hubs to one. This generated questions about the future contracting preferences of STEM Learning and whether there was a case for reducing further the number of Hubs to create fewer, larger Hubs. The review found little evidence that the scale of operation determined its success in delivery and achieving KPIs. The locality case studies suggested that regardless of the size of the parent organisation, having networked people who were known to key local stakeholders and were able to network with them was very important. Discussions about organisational restructure and review creates uncertainty and Hubs may find they lose key staff as a consequence. We therefore recommend that there is a case to commit to Hub stability until wider strategic issues are resolved.
- 4.6 Create named or 'branded' STEM Ambassador packages of activity that can be trialled, reviewed, marketed and scaled up to create a set of options that schools and colleges can engage with and subsequently tailor.** The case studies that the review considered (see Annex D) all have a set of named programmes. There might be an opportunity to create 'branded' programmes of engagement, or formalise alliances with other programmes to offer a clear menu of options for activity organisers to select. Local tailoring of interventions would be possible. There might be incentives in contracts to encourage focussing on particular year groups, places or schools. There might also be options to encourage individual or small groups of Hubs to pilot and evaluate these branded programmes. We recommend that UKRI with STEM Learning consider ways to segment their offer into branded packages of activities.
- 4.7 Recognise resource implications of additional activities, and if necessary scale back some actions to introduce new activities.** The maintenance of an up to date network of contacts in schools and colleges as well as a cadre of trained, DBS checked and ready STEM Ambassadors is a demanding job as there will naturally be churn within both the Ambassador and educational workforces. If additional activities or projects are introduced, they may take time away from this core activity. Any additional requests need careful management. Some Hubs may be better placed to deliver specific requests (for a training activity or material for a social media campaign for example), and it might be possible to allocate responsibilities accordingly. Not every Hub needs to deliver every additional request. Recognising resource implications does not necessarily mean providing additional funding but could be recognition through target-setting or moderation of other performance measures. We recommend that STEM Learning actively manage what is requested of Hubs and agree a tailored package of activity with each, spreading developments across the network.
- 4.8 Expand the use of impactful sustained interventions.** The need to focus on impact was a feature of many consultations undertaken during the review. That impact might be greater, or at least easier to identify, through sustained interventions was commonly cited. Further

work using action research or other forms of practitioner engagement<sup>6</sup> should be resourced to incentivise the creation and delivery of sustained interventions with schools, colleges and community groups. These would also provide a body of practice that could be the focus of impact research and evaluation.

- 4.9 Focus on Priority Schools by investigating their experiences of the programme, with a view to developing an offer tailored to their needs.** Currently the Department for Education's Priority School status is only used to identify schools in need, but this does not afford them priority status within the STEM Ambassador programme (in terms of resources or targeted activity). We recognise that in practice, Hubs may well be working hard to reach their population of Priority Schools. But there is no clear rationale established for why STEM Ambassadors should work with these schools and colleges, what they should expect to achieve and whether resources should be weighted towards these schools.
- 4.10** It would also be helpful to understand how Priority Schools experience the programme and whether their experience is any different to any other school. Are they part of a network, do they work with the Hub to develop bespoke solutions to the issues they face, do they have multiple Ambassadors delivering multiple activities? We recommend an investigation into the experiences of Priority Schools and Hubs with a view to recommending a strategic plan for engagement with Priority Schools.
- 4.11 Review KPIs to ensure they reflect the broad aims and objectives of the programme, while maintaining the broader set of performance measures that are reported.** The performance indicators reflect what can be measured and reported using the digital platform. Current data capture systems provide a useful range of insights into the number of active Ambassadors, their characteristics, activities and the number of hours they volunteer. For consistency and continuity we recommend that current measures continue to be recorded and reported.
- 4.12 Rationalise reporting arrangements so that each KPI is given a statistical measure, progress towards strategic priorities are RAG rated and any written narrative is aligned to these.** Monitoring reports are used primarily to ensure delivery of a contract. What is reported should align with what has been contracted. Statistical measures (outputs or more subjective RAG assessments of progress) should be accompanied by a brief commentary that sets out any barriers and enablers that explain what is being reported. An assessment of risks associated with contract delivery can be part of this report. Additional reporting, for example to identify examples of effective practice, innovative new ideas, case studies or good news stories can follow a different system and may be required less frequently. We recommend a review of the use and utility of current reporting systems (from Hubs to STEM Learning and from STEM Learning to UKRI) to create a shorter monthly reports whose purpose is to review the contract.

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<sup>6</sup> Action research is a collaborative and participative method of investigation that is focussed on exploring the effectiveness of a specific action. It is often used by teachers and tutors to improve their own, or a team's educational practice.

- 4.13 Adapt data capture systems so that reports drawn from it provide insight into a wider range of key strategic priorities including number and type of schools that have multiple engagements or engage regularly with the programme.** Data systems were set up to measure and report on numbers of STEM Ambassadors actively engaged with the programme. The review was told that formerly this was the key metric. However, as the programme has developed this becomes necessary but not sufficient as there are other aspects of the programme that are of both strategic and operational interest. These include issues of demand (were all requests for activity provided for?), sustained interventions (do Ambassadors deliver a programme of interventions or 'one-off' talks or events), sustained relationships with activity organisers (which schools and colleges use the Ambassador programme regularly and intensively?). It also includes the numbers of characteristics of individual young people reached by STEM Ambassadors. We recommend that the design of the data capture systems be revisited to reflect delivery of sustained key objectives. A trial that looked at how current information might be analysed would be necessary to scope any additional changes that would be required to the digital platform to make this happen.
- 4.14 Improve data quality through provision of advice for those inputting data and regular data cleaning.** Within the data reported from the digital platform, some fields report very high instances of 'other' when pre-defined categories are used. This limits the utility of such data. We recommend that additional advice or data cleaning is undertaken to enhance data accuracy.

# SQW

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