Evidence for Excellence in Education

Summary report

Evaluation of STEMNET's operations and impacts 2011-2015

National Foundation for Educational Research (NFER)

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Evaluation of STEMNET's operations and impacts 2011-2015: Summary report

Between September 2011 and March 2015, the National Foundation for Educational Research evaluated STEMNET's operations and impact. This report is a summary of the key findings.

1. About STEMNET

STEMNET works to ensure that future generations are able to appreciate and understand the role of science, technology, engineering and mathematics (STEM) subjects and careers in the world around them and that more young people enter careers in STEM. Its two key programmes targeted at students are the STEM Ambassadors Programme and the STEM Clubs Programme. It also provides support, advice and guidance to teachers through the Schools' STEM Advisory Network.

- STEMNET works with more than 3,000 employers across the UK.
- STEMNET has over 30,000 trained STEM Ambassadors - more than 40% are female and over 60% are aged under-35.
- In 2014-15, 93% of UK secondary schools accessed STEM Ambassadors as did many primary schools and FE colleges.
- During 2014-15, over 630,000 pupils and 21,000 teachers were involved with STEM Ambassador activities with demand continuing to grow.
- In 2014-15, more than 75% of secondary schools accessed STEMNET's advice to operate STEM Clubs.

2. Impacts

STEMNET's STEM Ambassadors and STEM Clubs Programmes, together with its Schools' STEM Advisory Network, have resulted in a range of positive impacts for their beneficiaries - pupils, teachers, schools, STEM Ambassadors and employers.

Impacts on young people

The evaluation findings showed that the greatest impact was achieved where pupils had multiple engagements with STEM Ambassadors and/or had regularly attended a STEM Club.

- Nine out of 10 teachers (93%) reported that pupils had increased knowledge and understanding of STEM subjects after involvement with STEMNET's programmes.
- Nine out of 10 teachers (89%) reported that STEM Clubs increased pupils' awareness of the importance and real-world applications of STEM subjects as well as developed transferable or leadership skills.
- Three-quarters of pupils agreed with the statement that after involvement with STEMNET's programmes 'I know more about why science is important for everyday life' (75%) with around two-thirds agreeing for mathematics, D&T and engineering.
- Seven out of 10 pupils (71%) who had taken part in STEMNET's programmes were more interested in studying science compared to four out of ten pupils (44%) who had not

taken part. In addition, six out of ten pupils were more interested in studying mathematics, D&T and engineering.

- The majority of pupils reported positive impacts in relation to their enjoyment (61%), interest (60%) and progress (58%) in STEM subjects.
- More than six out of ten pupils (63%) surveyed who had engaged with STEMNET's programmes wanted a STEM job compared to four out of ten pupils (42%) who had not been engaged with the programmes.

"Speaking to STEM Ambassadors, seeing what careers they have and what apprenticeships you might take and what careers you could take after that...it's shown me how interesting it would be if I took a STEM career. Having these subjects means you get a better career." **(Pupil)**

"That for me is the most important thing **[about STEM Club]** ***is that they are applying the skills they are learning in school to real life situations…they get a wider perspective of what science is about."*** **(Science teacher)**

Impacts on teachers

- Nine out of 10 teachers reported that working with STEM Ambassadors (89%) and being involved in the STEM Club (90%) had had a positive impact on their school.
- Eight out of 10 teachers reported their increased understanding of the benefits of STEM enrichment and enhancement activities (82%) and their increased use of real life contexts in teaching (81%), as a result of their involvement in the STEM Clubs Programme.
- More than three-quarters of teachers reported their increased understanding of STEM business and industry (81%), increased awareness of STEM career/employment options and the skills required (81%), and improved relationships with STEM business and industry (73%) as a result of their contact with STEM Ambassadors.
- Two-thirds of teachers (62%) reported that it would not have been at all possible to deliver STEM activities, or they would have delivered them on a lesser scale, if they had not received support from the STEM Ambassadors Programme.

"It **[having STEM Ambassadors in school]** ***reacquaints us with some of the things that are going on in the real world, some of the technologies and the advancements and the research, it's good for us to hear about it and we can share those things with the students later in class."*** **(Science teacher)**

Impacts on STEM Ambassadors and employers

- More than eight out of ten STEM Ambassadors reported positive impacts in relation to their sense of personal satisfaction with work (91%) and their confidence and motivation in working with schools and young people (82%).
- More than half of STEM Ambassadors (59%) reported that they had developed a range of new and existing skills such as communication, presentation and networking as a result of their involvement in the STEM Ambassadors Programme.
- Employers have benefitted from the increased skills and motivation of their STEM Ambassador employees as well as realising positive business-related impacts. These include: fulfilling their corporate social responsibility objectives, raised awareness and profile of their company, and progress towards building a supply chain of potential employees within schools.

"The range of activities means staff get to build a different skill set. We're managing their development, so staff gain some mentoring and leadership skills and problem solving…" **(STEM employer)**

3. Satisfaction

Teachers, STEM Ambassadors and employers reported high levels of satisfaction with STEMNET's programmes and services.

- Three-quarters of pupils rated their experiences of STEM Ambassadors (76%) and STEM Clubs (80%) as 'Very good' or 'Good'.
- Nearly eight out of 10 teachers (76%) found the Schools' STEM Advisory Network useful in making them more aware of the range of enrichment and enhancement opportunities they could engage with.
- Eight out of 10 STEM Ambassadors (80%) said that the quality and effectiveness of the support offered by STEMNET was 'Excellent' or 'Good'.
- More than eight out of 10 teachers said that they intended to use the STEM Ambassadors Programme (83%), run a STEM Club (82%) or access STEM information and advice via STEMNET (87%) in the future.

***"They* [STEMNET] *are incredibly effective and there are a large number of students involved* [in STEM Clubs]. *There's a large number of people coming in and you can't underestimate the value of it. The range of activities that goes on is fantastic!"* (Science teacher)**

***"They're* [STEMNET contract holder] *a great partner to help you launch a STEM ethos, initiative, approach, working group – whatever it might be…They're a very good start, they have some good advice and ideas…"*(Science teacher)**

***"As an organisation, we feel that we've had much more out than we have put in. The benefits to everybody are just so evident that I just think that every organisation should be doing this."* (STEM employer)**

4. Effective practice

There are many positive features of STEMNET's programmes and services which include:

- the development of strong and sustained relationships with schools, including the breadth and quality of advice and free resources provided
- an increasing focus on engaging schools in disadvantaged circumstances and/or with little or no previous STEM involvement. This has been achieved through, for example: using varied forms of communication, sharing effective practice, and developing plans that meets the school's unique needs and situation
- the recruitment, training and support of STEM Ambassadors, including the process of matching STEM Ambassadors' skills and expertise to the needs of schools.

5. Recommendations

Throughout the evaluation period, STEMNET showed itself to be a learning organisation which identifies and disseminates effective practice and actively pursues continuous improvement. The recommendations in the box over the page indicate areas in which STEMNET should continue to exemplify effective practice as well as areas for enhancement.

STEMNET should:

- continue its efforts in engaging: schools in disadvantaged circumstances and/or with little or no previous STEM involvement; employers in less well represented sectors (e.g. in public health and food) and SMEs; and STEM Ambassadors in mathematics
- continue to provide ongoing support and training to STEM Ambassadors
- maintain its emphasis on encouraging schools to provide pupils with multiple opportunities to engage with STEM Ambassadors over the course of the year to achieve the strongest positive impacts
- continue to provide a quality service to schools through impartial advice and support to enhance STEM teaching
- augment the support provided to schools through the STEM Clubs Programme, including more targeted support for teachers setting up new clubs
- place more emphasis on sharing effective practice, particularly in engaging schools which are hard to engage and STEM Ambassadors and employers in less well-represented sectors
- better help schools understand the variety of STEM Ambassadors available to them within their sub-region, including the wide range of careers and backgrounds they come from as well as the option to access support remotely via video-conferencing
- further develop the STEMNET and STEM Clubs websites to provide more of a main point of contact for schools seeking STEM support, with links to other information and resources.

6. About the evaluation

The table below provides an overview of the evaluation design and the type and number of consultees who took part.

Method	2012 (N)	2013 (N)	2014 (N)
Pupil online survey	5627	4081	7698
Teacher telephone survey	402	-	371
School case studies	12	12	12
Online survey of STEM Ambassadors	3415	-	3212
STEM Ambassador case studies	10	10	8
Employer case studies	10	10	9
Consultations with STEMNET staff	13 interviews 16 surveys/proformas	20 surveys/ proformas	18 surveys/ Proformas
Consultations with STEMNET's contract holders	9 interviews	32 surveys	25 surveys

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