



Embedded Learning Teacher Survey

Headline Findings

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This report summarises the main findings from EngineeringUK's Embedded Learning Survey, which collects feedback from teachers who have taken their pupils to Big Bang and Tomorrow's Engineers STEM engagement activities.

With this survey, we aim to:

- collect valuable feedback which will help EngineeringUK improve the delivery of its programmes
- find out what teachers believe they and their students gain from attending EngineeringUK's events
- identify any barriers to attendance
- assess the extent to which teachers 'embed' the learning gained from attending EngineeringUK's STEM engagement activities into their teaching, and determine the usefulness of the careers materials made available to them

Participating teachers

Demographic information

434 teachers whose pupils had attended a Big Bang or Tomorrow's Engineers activity completed the Embedded Learning Survey between July 2018 and August 2019. Responses to the survey questions were based on the most recent event their pupils had attended over the preceding 12 months. These were spread across our event strands as follows:

Q. Please select the most recent event that you and your students attended.

Event	Count	Proportion
The Big Bang Fair	185	43%
Big Bang Near Me and @ School	80	19%
Energy Quest	97	22%
Robotics Challenge	72	17%
Total	434	100%

63% of teachers were female, 35% were male and 2% preferred not to state their gender.¹

When asked to specify all the subjects they teach, the most common responses were physics (36%), chemistry (35%), core and additional science (35%) and biology (32%). Just 13% were maths teachers.

Knowledge and perceptions of STEM education and careers among teachers

51% of teachers said they knew quite a lot or a lot about what people in engineering careers do. Their self-reported knowledge was comparatively higher about careers in science (66%) and lower for careers in technology (49%).

¹ Note that not all teachers wanted to provide their demographic information. For example, 390 of the 434 (90%) teachers responded when asked about their gender.

67% of teachers said that they felt fairly or very confident in providing engineering-related careers advice. The corresponding figures for science and technology were 73% and 61%.

Teachers tended to consider STEM careers to be desirable for their pupils. 78% of teachers viewed engineering careers as quite or very desirable. The corresponding proportions for science and technology were both 79%.

Overall experience of the event

Rating

Teachers' experience of Big Bang and Tomorrow's Engineers events were overwhelmingly positive, with 91% rating the activity good or excellent, and only 4% rating the activity poor or very poor.

Q. How would you rate the event overall? (% answering good or excellent)

Event	
The Big Bang Fair	88%
Big Bang Near Me	96%
Energy Quest	92%
Robotics Challenge	94%

Likelihood of recommendation

83% of teachers said they were quite likely or very likely to recommend the event to a colleague, while just 14% said they were quite unlikely or very unlikely to do so.

Q. How likely would you be to recommend the event to a colleague? (% answering quite likely or likely)

Event	
The Big Bang Fair	78%
Big Bang Near Me	86%
Energy Quest	85%
Robotics Challenge	88%

Ease of and barriers to attendance

EngineeringUK strives to ensure that all young people from across the UK have the opportunity to attend Big Bang and Tomorrow's Engineers events. An important part of this is making it easy for teachers to arrange for them to do so.

A large majority of teachers (87%) found that registering their students' attendance was easy or very easy, and 72% of teachers found it easy or very easy to arrange for their students to get to the event.

The barriers most commonly mentioned were around the distance they needed to travel, a lack of funding, internal admin and paperwork, arranging cover, excessive queuing, arranging coaches and parking.

Success of the event in inspiring young people to pursue engineering

Perceived barriers to young people pursuing engineering careers

The three main barriers preventing young people from considering or pursuing engineering careers identified by teachers were:

- A lack of exposure to real life applications of engineering in the classroom (selected by 71%)
- A lack of knowledge about the diversity of engineering careers (selected by 66%)
- A lack of work experience opportunities (selected by 54%)

Indicators of success for the event

Teachers rated how successful they thought the event was on several key indicators. Encouragingly, a large majority of teachers thought the event increased their pupils' interest in engineering (86%) and raised pupils' awareness of the variety and diversity of engineering professions (82%).

Q. To what extent do you agree or disagree that the event was successful in the following ways?

Success indicator	% agree or strongly agree
Increasing my pupils' interest in engineering	86%
Inspiring my pupils to want to become engineers	74%
Raising my pupils' awareness of the variety and diversity of engineering professions	82%
Improving my pupils' knowledge of what to do next in order to become an engineer	57%
Increasing my pupils' likelihood of taking up STEM subjects at GCSE	68%
Signalling to pupils that the engineering sector welcomes young people from all social and demographic backgrounds	67%

Careers messaging at the event

Careers messaging is central to EngineeringUK's mission to inspire the next generation of engineers and we aim to ensure that careers information and guidance feature in all Big Bang and Tomorrow's Engineers events.

Among teachers who took a careers resource pack back from the event (44%), over half (57%) found it to be either useful or very useful. These careers resources were most



commonly used by teachers to display one or more of the classroom display posters (61%) and to talk about or pass on these resources to colleagues (48%). Some commented that they would have liked these to be made even more widely available.

Over two thirds (67%) of teachers who said that their students had taken part in a careers activity at The Big Bang UK Young Scientists & Engineers Fair thought that it had improved their students' understanding of STEM careers.

For example, 72% of teachers whose students had met a 'Careers Captain' - a scientist or engineer who roams the showfloor or works on exhibition stand - agreed or strongly agreed that the experience had improved their students' understanding of STEM careers.

57% of teachers whose students had taken part in the 'Meet the Future You' quiz - which quizzes young people on their skills and interests to identify different areas of engineering they might enjoy working in in the future - agreed or strongly agreed that it had improved their students' understanding of STEM careers.

Of those whose students had attended one of EngineeringUK's regional BBNM Fairs, 32% said that their students had interacted with a Careers Captain and of those, 82% thought that the interaction was useful or very useful for increasing students' knowledge and desirability of STEM careers.

In addition, since taking part in the activity, 51% of teachers said they felt more confident in speaking to their students about careers in engineering.

Suggestions for improvement

Suggestions for what EngineeringUK could do to support the teaching community to encourage more young people to consider or pursue engineering careers include facilitating greater links between schools and engineering companies through workplace visits, work experience, STEM ambassadors, visiting speakers, interactive workshops and activities.

Particular suggestions for improvement included:

"Having some more ambassadors fresh from university, such as Masters students or recently employed engineers telling their story. Pupils will enjoy connecting with real people more than just being told all the amazing things we can do."

"Examples of places in my area that employ engineers"

"More relevant videos, that show a range of engineering jobs in action - showing pupils the dynamic of a range of working environments and what each job entails."

"More examples of under-represented groups including ways of highlighting careers to girls."

"More case studies. Students relate immediately when they hear about people like them achieving important things."