

EQUITY DIVERSITY AND INCLUSION (EDI) BURSARY: 2022/23 SCHEMES

Neon, Robotics Challenge, Big Bang at
School and The Big Bang Fair



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EQUITY, DIVERSITY AND INCLUSION (EDI) BURSARY SCHEMES

This report provides an overview of EngineeringUK EDI bursary schemes implemented during the 2022/23 academic year. These bursaries were awarded to schools with high proportions of students from groups that are underrepresented in the engineering profession, referred to as 'priority schools'¹. The primary goal was to offer financial assistance to these schools, helping them overcome barriers to participating in STEM engagement activities. The overarching aim is to encourage greater involvement of young people from these underrepresented groups in such activities, thereby inspiring their interest in STEM careers.

EDI bursary eligibility

To be eligible for an EngineeringUK bursary, a school must meet the 2022/23 EngineeringUK equity, diversity, and inclusion (EDI) criteria. These criteria identify EngineeringUK's priority schools that have a high proportion of students from underrepresented groups in engineering.

Schools that meet the EDI criteria are:

- Schools with both an above-average proportion of students eligible for free school meals (FSM) and an above-average proportion of ethnic minority students.
- Schools with a significantly above-average proportion of students eligible for FSM, ethnic minority students, students with special educational needs, or are based in a rural location.
- Single-sex girls' schools with an above-average proportion of students eligible for FSM and/or an above-average proportion of students from ethnic minority backgrounds.

For more information about the EDI criteria, please visit the Tomorrow's Engineers website:

www.tomorrowsengineers.org.uk/improving-practice/resources/engineeringuk-edi-criteria/

EDI bursary schemes available in 2022/2023

The bursaries are available for priority schools to cover costs related to their participation across various EngineeringUK STEM initiatives or programmes. The following schemes were available over the past year:

- **Neon bursary** - A £750 bursary to help priority secondary schools take part in an engineering experience listed on Neon. The platform offers a range of engineering experiences from both EngineeringUK and various other STEM engagement providers in the UK.
- **Robotics Challenge bursary** - A £400 bursary to support priority schools taking part in Robotics Challenge to widen programme participation, particularly among young people from underrepresented groups in engineering and technology. These funds can also be used to assist schools in purchasing kit or covering travel expenses for participation in Robotics Challenge competition heats. There was an additional £350 travel bursary to facilitate attendance at the Big Bang Fair 2023 Robotics Challenge Final.
- **Big Bang at School bursaries** - A bursary of £1000 for schools participating in the programme for the first time and £500 for schools that have taken part before that could be used to pay for STEM activities and equipment to make the event richer for students and more engaging for those from underrepresented groups in engineering and technology.
- **Big Bang Fair travel bursaries** - A £500 bursary that could go towards transport and teacher cover to enable school groups to attend the Big Bang Fair. The Great British School Trip offered a separate bursary of £3.75 per student for groups of 30 or more to help priority schools attend the Fair.
- **The Big Bang Competition travel bursary** - the bursary was open to competition teams from priority schools that were invited to showcase their project at the Big Bang Fair in Birmingham. Teams were able to put in a request for the amount of money they needed for transport to the Fair.

¹ EngineeringUK defines as priority the secondary schools who meet our Equity, Diversity and Inclusion (EDI) criteria, based on student population with higher numbers of groups typically underrepresented in engineering. Primary schools were not included in the EDI criteria in 2023. For more detail, see EngineeringUK EDI Criteria - Tomorrow's Engineers (tomorrowsengineers.org.uk)

OVERVIEW OF 2022/23 EDI BURSARIES

In the 2022/2023 academic year, a total of 192 bursaries were offered to priority schools to support them to take part in one of five key EngineeringUK STEM initiatives or programmes.

Bursary applications

Table 1 shows the number of schools that applied for bursaries, those that were successful in their application, and those that subsequently completed the associated programmes.

In total, there were 562 bursary applications made in 2022/23 across all schemes, of which 192 bursaries were offered, a 34% application to offer rate.

Some bursaries were in high demand and received many more applications than there were bursaries available, such as Neon, where only 13% of applications were offered a bursary.

To ensure that bursaries were allocated fairly, bursary applications were carefully reviewed and schools that met the eligibility requirements and demonstrated a clear alignment with the aims of the bursary within their application form were shortlisted which slightly reduced the number of eligible applications. From this list, schools were randomly selected to receive the bursaries.

Table 1. Applications and completion rates for bursary schemes in 2022/23

Bursary scheme (amount funded)	No. of bursary applications	No. of bursaries offered	% of applications offered bursaries	No. of schools that completed bursary requirements	% of schools that completed the bursary requirements
Neon (£750)	189	24	13%	14	58%
Robotics Challenge (£400)	137	28	20%	16	57%
Robotics Challenge travel bursary (£350)	3	3	100%	3	100%
Big Bang at School (£1,000 for schools new to the programme, £500 for repeat schools)	83	65	78%	63	97%
The EngineeringUK Big Bang Fair travel bursary (£300)	134	40	30%	32	80%
The Great British School Trip Big Bang Fair travel bursary (£3.75 per student)	94	23	24%	19	83%
The Big Bang Competition (varying amounts)	9	9	100%	9	100%
TOTAL	562	192	34%	156	81%

Completion rates

Across all bursary schemes, 81% of schools who were offered a bursary went on to complete the programme and fulfilled the requirements to receive the funds.

Some bursary schemes had high non-completion rates such as Neon where 42% of schools who applied for a bursary did not end up taking part in a Neon activity within the school year.

Learnings and recommendations

The high number of priority schools applying for EDI bursaries compared to the number of bursaries available suggests that many more schools could benefit from the bursary programme if more funding was available.

To address non-completion rates in future years, the number of bursaries offered could be overallocated to account for potential dropouts.

We could also look to investigate why certain schools, even with bursary support, don't complete the programmes. Some priority schools might encounter additional barriers that the bursaries alone don't address. Identifying these challenges and providing support to these schools in STEM activities is crucial.

Characteristics of participating schools

Figure 1. shows the EDI criteria² met by the schools who completed each of the bursary schemes.

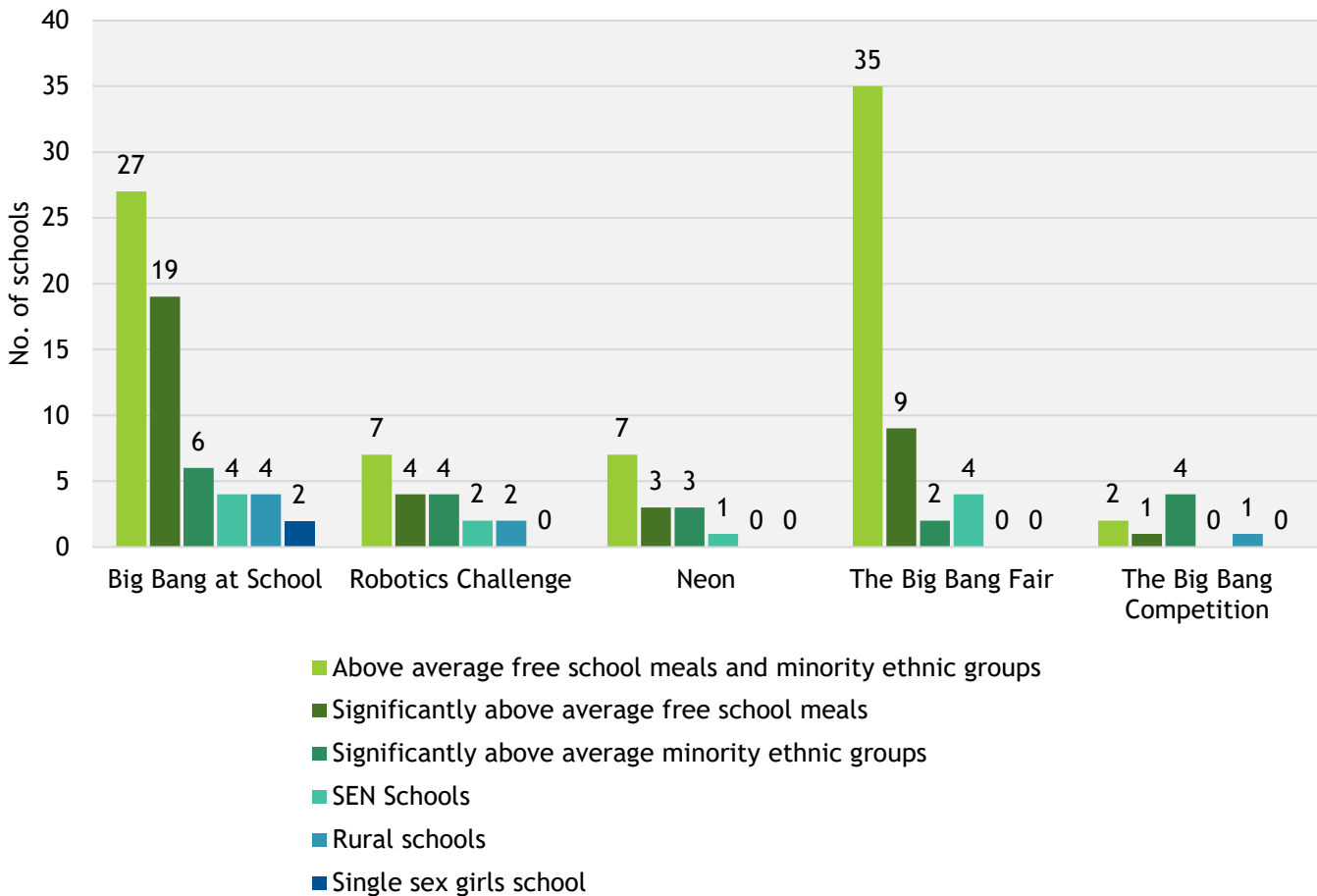
Across all bursary schemes:

- Around half of schools (51%) were eligible for a bursary for having both above average proportions of students from ethnic minority backgrounds and above average proportions of students eligible for free school meals
- Around a quarter (24%) had significantly above average proportions of students eligible for free school meals

- 12% had significantly above average proportions of students from ethnic minority backgrounds
- 7% were special educational needs (SEN) schools
- 5% were rural schools
- 1% were single sex girls' schools that were also above average for one of the other EDI criteria

See Annex 1 for a more detailed breakdown of school characteristics.

Figure 1. EDI criteria met by schools who completed the bursary programmes in 2022/23 (n=153)



² For more detail of how the EDI criteria are defined and calculated, visit Tomorrow's Engineers (tomorrowseengineers.org.uk)

Regional reach of bursaries

Table 2 shows the geographical spread of the schools that received and completed a bursary scheme in 2022/23. The large majority (80%) of schools completing a EngineeringUK bursary programme in 2022/23 were based in England, 11% from Wales, 6% from Northern Ireland, and 3% from Scotland.

The choice of Birmingham as the venue for the Big Bang Fair 2023 resulted in a higher representation of schools from the West Midlands, accounting for 16% of total participating schools.

Other bursary programmes had wider geographical reach, such as the Big Bang at School programme, with schools from Wales, Northern Ireland, and Scotland participating.

Surprisingly, the Neon bursary scheme, which provides experiences that are available to schools across the UK was only completed by schools in England. There is potential to expand the reach of the bursaries further throughout the UK.

The remaining sections of this report provide more detail on the bursary schemes implemented as part of each of the four EngineeringUK initiatives, summarising how schools participated in these programmes, how students were selected as well as teacher feedback on their experiences and views of the bursary they received.

Table 2. Location of schools who completed a bursary programmes in 2022/23

BURSARY PROGRAMME													
	Big Bang at School		The Big Bang Competition		The Big Bang Fair		Neon		Robotics Challenge		TOTAL		
West Midlands	5	8%	0	0%	19	37%	1	7%	0	0%	25	16%	
South East	10	16%	2	22%	4	8%	2	14%	3	16%	21	13%	
London	8	13%	2	22%	3	6%	3	21%	3	16%	19	12%	
East Midlands	4	6%	0	0%	9	18%	2	14%	2	11%	17	11%	
Wales	13	21%	1	11%	2	4%	0	0%	1	5%	17	11%	
Yorkshire and the Humber	4	6%	0	0%	6	12%	1	7%	2	11%	13	8%	
North West	1	2%	2	22%	5	10%	1	7%	2	11%	11	7%	
Northern Ireland	8	13%	1	11%	0	0%	0	0%	1	5%	10	6%	
South West	5	8%		0%	1	2%	0	0%	1	5%	7	4%	
East of England	2	3%	1	11%	1	2%	1	7%	1	5%	6	4%	
North East	2	3%		0%	1	2%	3	21%	0	0%	6	4%	
Scotland	1	2%	0	0%	0	0%	0	0%	3	16%	4	3%	
TOTAL	63	100%	9	100%	51	100%	14	100%	19	100%	156	100%	

ABOUT THE NEON BURSARY SCHEME

The Neon bursary scheme provided priority schools a £750 bursary towards a STEM engagement experience listed on Neon. The bursary is designed to help more priority schools take part in high quality engineering activities.

Schools could use the money to:

- Book a Neon experience
- Pay for activities to enhance a Neon experience
- Purchase or lease equipment, materials, or resources specifically needed for the Neon experience
- Travel to the Neon experience

Applications

From October to November 2022, 189 schools applied for a Neon bursary. To apply, teachers filled out a form explaining how they'd use the funds in line with the bursary's objectives. In December, the applications were reviewed, and 24 schools fitting the criteria were randomly selected.

Out of these, 14 schools undertook a Neon activity and were granted the funds, a 58% completion rate. These schools were required to complete the activities before the end of the academic year and received their funds post-completion. Following their Neon experience, teachers filled out a survey, sharing demographic information about participating students and feedback on the bursary's usage and its impact on students.

School participation

The 14 schools that received a bursary involved a total of approximately 2,000 students in a STEM experience listed on Neon. The groups that took part in the activities ranged in size from 30 students to 450 students.

Teachers reported using different criteria to select students for participation in the Neon experience, including:

- Selecting all students in one or more year groups (6 schools)
- Selecting all students in one or more classes (4 schools)
- Targeting students who would not typically have an opportunity to participate in these kind of activities (3 schools)
- Selecting students who had shown the best engagement with their homework (1 school)

Student characteristics

Teachers from 12 out of the 14 schools provided data on the characteristics of the students who participated in the Neon experiences (Table 3).

From these schools, over half (54%) of students were from UK ethnic minority groups and just under half (46%) were eligible for free school meals. In comparison, 28% of English state school students are from ethnic minority backgrounds and 23% are eligible for free school meals³. However, only 37% of the participating students were girls, primarily because two of the participating schools were all-boys schools. Additionally, 11% of students that took part were disabled, including 63 students from a SEN school.

Table 3. Characteristics of students who took part in a Neon experience through the bursary scheme

Student characteristics	Number of students	% of students
Gender		
Male	971	63%
Female	577	37%
Other Gender identity	1	<1%
Missing	451	
Ethnicity		
Asian/Asian British	420	28%
Black/Black British	172	11%
Multiple ethnic groups	100	7%
White	685	46%
Other ethnic group	119	8%
Missing	503	
Free school meals		
Eligible for FSM	701	46%
Not eligible for FSM	818	54%
Missing	480	
Disabled students	216	11%
Total students	1999	

Use of the bursary

All but one school used the bursary money to pay for an experience listed on Neon or for resources and equipment needed for the experience. Two schools used the money for travel to the experience.

The STEM experiences schools took part in included workshops (11 schools), competitions (2 schools), guest speakers (1 school) and STEM shows (1 school).

Most of these experiences took place within one school day (8 schools) or half a day (3 schools), some took place over multiple sessions or more than one school day (3 schools). Visit the Neon website to see the variety of experiences available

<https://neonfutures.org.uk/>

³ ONS. Students, pupils and their characteristics, 2022/2023

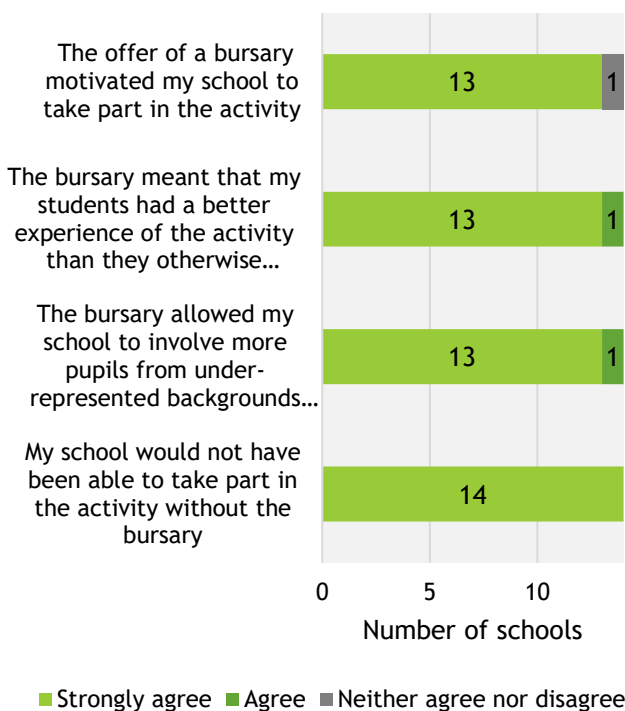
Teachers' views on the bursary's impact

Teachers were asked for their views on the impact of the bursary within the feedback survey.

As shown in **Figure 2**:

- All 14 teachers strongly agreed that their school would not have been able to take part in the Neon listed activity without the bursary
- All 14 teachers agreed (with 13 out of 14 strongly agreeing) that the bursary allowed their school to involve more students from underrepresented backgrounds
- All 14 teachers agreed (with 13 out of 14 strongly agreeing) that the bursary meant that their students had a better experience of the engineering activity than they otherwise would have
- All but 1 teacher strongly agreed that the offer of a bursary motivated their school to take part in a Neon experience

Figure 2. Teachers' perceptions of the impact of the bursary (n=14)



Interest in future engagement

Encouragingly, **all teachers said that they are quite or very likely to book another Neon experience in the future.**

Bursary amount

In the survey, teachers were asked whether the £750 bursary was enough to cover their costs for the programme. Half of the teachers told us that that the £750 bursary fully covered the expenses associated with their participation in the Neon experience they selected, while the other half found it necessary to secure additional funds, with an average of £200 in extra funding required. To supplement the bursary amount, teachers used funds from their existing budgets.

Teacher written feedback

As part of the Neon bursary completion survey, we asked teachers for written feedback on the bursary scheme. Key themes from their responses are summarised here.

Future participation in STEM activities

Teachers talked about their intention to continue participation in Neon experiences and seek future funding:

- “We will be applying for the bursary again and organising another event”
- “This will become an annual event”
- “I would like to continue to offer STEM activities aimed at the large % of PP pupils and girls. Activities need to be free or funded”

Several teachers talked about their drive to enhance and increase STEM-related activities and awareness in schools.

- “[We want} to use the day as a stepping stone to introduce other STEM careers as well as encourage engagement with other school offerings for STEM.”
- “Fab scheme - great to get any STEM promoted in schools with our socioeconomic background!!”

Positive Neon experiences for students

Teachers provided enthusiastic feedback on the positive effect of the Neon experience on their students, highlighting the importance of enabling more young people to access these STEM opportunities.

- “I would like to see the school take more opportunities like this because it did very well and really blew some pupils minds! A pupil said ‘it was the best day ever’”
- “Such a fantastic and positive experience. The students enjoyed the whole day immensely”
- “Our students are still talking about it so it must have had a strong impact”

Widening participation

Some of the feedback highlighted the crucial role of the bursary in supporting school engagement with the Neon experience and expanding its reach.

- “The process was easy and the bursary generous. Without it, I would not have been able to convince my managers to part with the cash to complete the event”
- “It was really great to receive this bursary as we would not have been able to reach as many students as we did to give them an introduction into the world of engineering”
- “The workshop was run as part of a whole-school, collapsed timetable week that aims to provide different opportunities to students that wouldn't usually be taught in lessons”
- “The session was very inspiring and tailored to our students following my conversation with them. This meant it suited our students and they were all engaged”

Application Process and Experience

Despite teachers generally sharing positive feedback related to the bursary and the Neon experiences they participated in, several teachers shared challenges they faced related to the timing, amount, and process of receiving funds.

- “It would be very useful to have the funds before the activity instead of at the end now as we have had to overspend our budget to do the activity and have not had the money yet.”
- “I wish the limit of the grant could be increased to allow more students to participate.”

Conclusion and learnings

The Neon bursary scheme was popular in 2022/23, receiving a high number of applications, despite having limited bursaries available. This suggests that if more funds were available, a greater number of schools could benefit from the programme.

However, a notable proportion of schools that were offered a bursary did not engage in a Neon experience. This suggests that the bursary may not be incentive enough or that factors other than cost may be preventing priority schools from taking part in STEM activities. It is important to identify and address what these additional barriers are so that we can support more schools to take part in quality STEM activities.

The schools that completed the programme involved a high proportion of students from ethnic minority backgrounds and students eligible for free school meals, which suggests that the bursary scheme is effective in reaching more students in these target demographics with high quality STEM experiences. The exception was girls, who were underrepresented in the bursary programme, due to a number of all-boys schools receiving the bursary.

Teachers provided positive written feedback about their views on the impact that the bursary had on motivating and enabling their school to take part in a STEM activity and providing their students with a positive learning experience. Teachers expressed an interest in booking more activities through Neon and building upon their STEM outreach offering within their school.

ABOUT THE ROBOTICS CHALLENGE BURSARY SCHEME

In the 2022/23 academic year, EngineeringUK offered £400 bursaries to priority secondary schools participating in the Robotics Challenge programme. The aim of the bursary was to support schools to purchase robotics kits or to travel to take part in Robotics Challenge heats.

A requirement of the bursary was that teachers ran a 60 minute 'Introducing Robotics' lesson in their school. The aim of this lesson was to help priority schools widen participation in the programme, particularly among young people from groups underrepresented in engineering.

Applications

137 schools applied for a bursary in November 2022, the applications were reviewed in December and 28 schools were selected at random and offered the bursary. Of these, 16 schools completed the requirements of the programme, a 59% completion rate. Funds were allocated after schools had delivered their programme and teachers shared their feedback.

Evaluation

Twelve teachers that received the bursary completed a feedback survey, which included questions about how they used the bursary funds and what impact they felt it had on their students.

How the bursary was used

Teachers spent the bursary money in the following ways:

- Buying new robotics kits, spares or repairs (8 teachers)
- Buying materials or resources to support running robotics activities in school (1 teacher)
- Travel to the competition heats or finals (1 teacher)

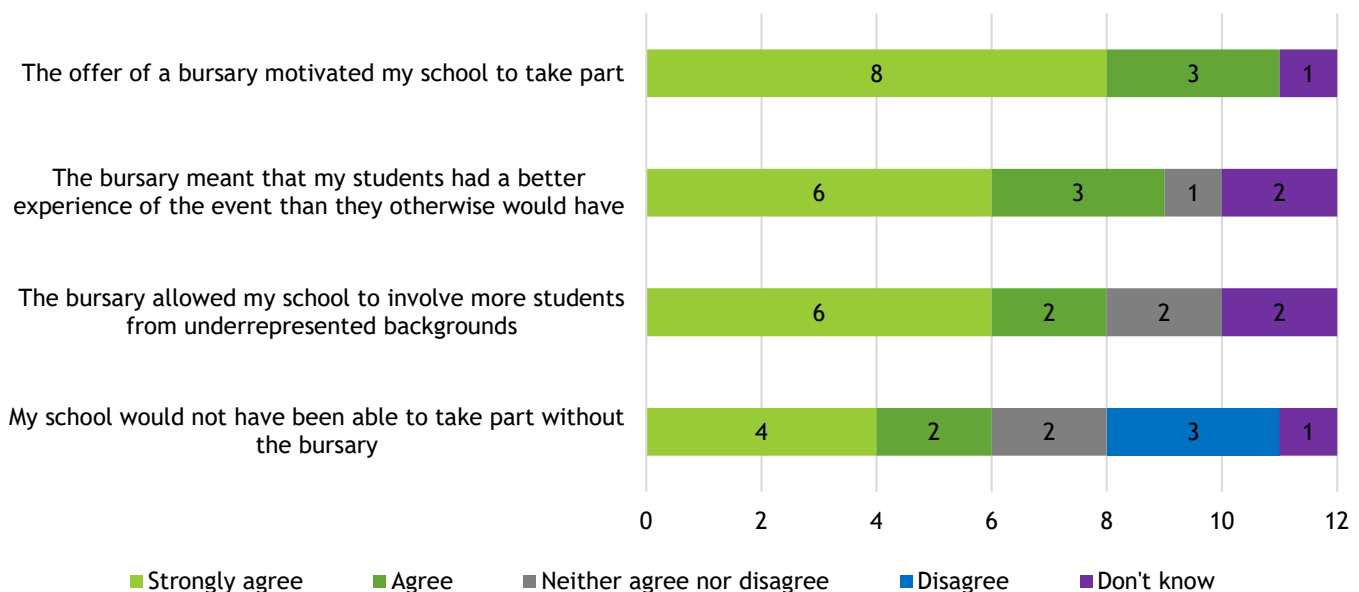
Two teachers said they had not spent the bursary money.

Teachers' views on the bursary's impact

Figure 3 shows teachers' responses to a series of statements about the perceived impact of the bursary.

- All but one (11 teachers) teachers agreed that the bursary motivated them to take part
- 9 out of 12 teachers agreed that it improved the experience for their students
- Two thirds (8 teachers) agreed that it enabled them to involve more students from underrepresented backgrounds
- Half of the respondents (6 teachers) agreed that they would not have been able to take part without the bursary

Figure 3. Teachers views on the bursary's impact (n=12)



Introducing Robotics lesson

Schools that received bursaries were required to run a 60-minute Introducing Robotics lesson during classroom time between November 2022 and April 2023.

The goal of the lesson was to encourage more young people, especially those from groups underrepresented in engineering, to consider robotics and sign up for the Robotics Challenge programme. Teachers were asked to deliver the lesson during school time to reach young people who might not have considered robotics before and possibly would be less likely to voluntarily sign up to the programme.

A total of 40 schools was recruited to take part in a pilot evaluation. The sample of schools also included schools that do not meet EngineeringUK's EDI criteria and were therefore not eligible for bursaries. These schools were given an incentive of £100 to participate in the pilot evaluation.

Evaluation

A total 592 students from 25 schools completed paper-based surveys before and after the Introducing Robotics lesson. Out of these schools, 12 were priority schools and received a bursary. The characteristics of the students who participated in the evaluation are presented in **Table 4**. Please note these include all recruited schools, including those that did not receive a bursary, as well as an overview of student characteristics from participating priority schools.

Findings

The evaluation found that students were more likely to express interest in robotics or coding activities after the lesson compared to their interest levels prior to it. Furthermore, students with previously limited engagement in technology-related activities were more than twice as likely to report an increase in their interest in robotics or coding activities after the lesson, compared to those who had previously been highly engaged in technology-related activities. This highlights the importance of conducting the lesson with students who have not already been engaged in such activities or had not previously considered participating in them.

It is important to note that the lesson alone may not be enough to lead students towards taking part in additional robotics or coding activities, beyond fostering initial interest. We know from previous evaluations and wider evidence that multiple encounters would likely be needed to build on students' interest over time. However, these findings are promising in terms of considering approaches for widening participation in STEM outreach.

The full evaluation report for Introducing Robotics will be available on the EngineeringUK website.

Table 4. Characteristics of students taking part in the Introducing Robotics lesson evaluation

Student characteristics (n=592)		Total (No.)	Total (%)	Priority Schools (No.)	Priority Schools (%)
Gender	Female	273	46%	104	43%
	Male	301	51%	130	54%
	Prefer to self-describe	3	1%	-	-
	Prefer not to say	11	2%	6	3%
	Total	588	-	240	-
Ethnic groups (n=578)	Asian/Asian British	80	14%	60	25%
	Black/Black British	26	4%	13	5%
	Mixed or multiple ethnic groups	36	6%	15	6%
	White	381	66%	127	53%
	Other ethnic identity	18	3%	12	5%
	Prefer not to say	37	6%	11	5%
Total	578	-	238	-	
Disability (n=583)	Yes	61	10%	44	18%
	No	401	69%	150	63%
	I don't know	77	13%	30	13%
	Prefer not to say	44	8%	14	6%
	Total	583	-	238	-

ABOUT THE BIG BANG AT SCHOOL BURSARY SCHEME

The Big Bang at School bursary scheme supported priority schools with high numbers of students from groups underrepresented in engineering to run a Big Bang at School event at their school in the 2022/23 academic year.

Schools could apply for a bursary of £1000 (for those new to the programme) or £500 (for repeat schools) to help them deliver an engaging Big Bang at School programme. Bursary funds could be used to pay for STEM activities, equipment and resources to enhance the event for students.

Applications

A total of 83 schools applied for a bursary between October and December. The applications were reviewed in January and 65 schools were offered a bursary. Of these, 63 schools (33 new schools and 30 repeat schools) delivered a Big Bang at School event, a 97% completion rate. Funds were allocated after schools had delivered the Big Bang at School and fulfilled the requirements of the bursary.

Evaluation

38 teachers at 30 schools completed an evaluation survey after delivering the Big Bang at School event. The survey responses come from both new and repeat schools. In addition, six teachers participated in feedback interviews, aimed at better understanding their experiences and views of the programme and the bursary.

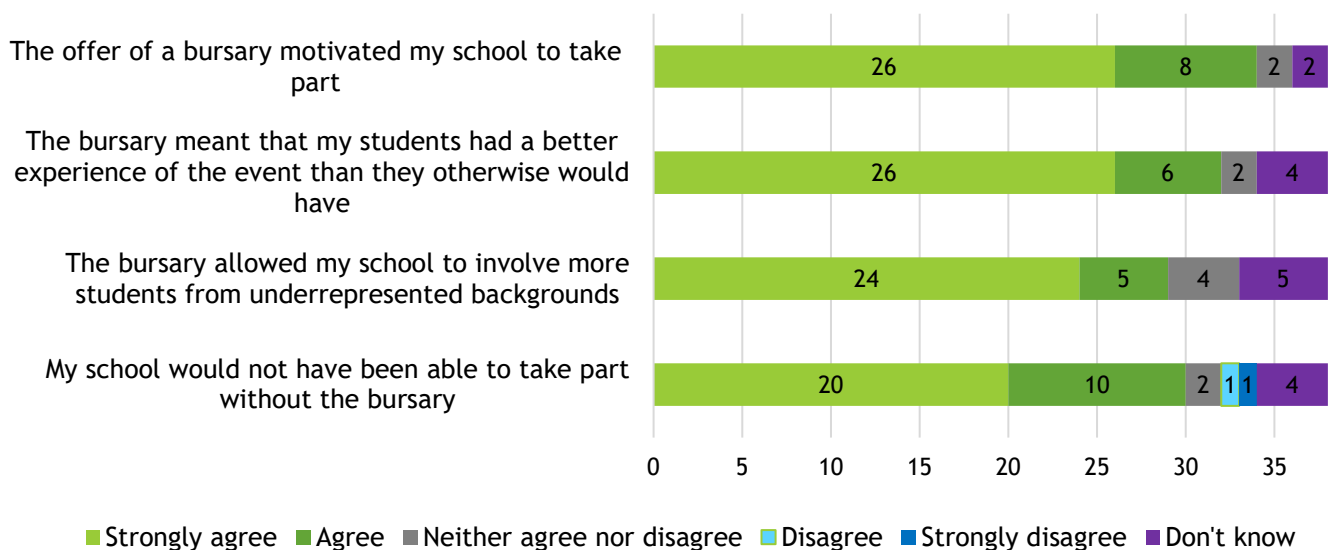
Use of bursary funds

- The most common ways teachers reported using the bursary funds were:
- STEM engagement activities to enhance Big Bang at School (53%)
- Buying materials or resources to support running Big Bang at School (39%)
- Around a quarter of teachers surveyed said they had not spent the money yet or did not know how it had been spent, or did not identify any areas of spend. This could be because some of the teachers completing the survey were not the same teachers who had oversight of the bursary or that the schools had not spent the funds in advance of running the event.

Teachers' views on the bursary's impact

- **Figure 4** shows teacher's responses to a series of questions about their views of impact of the bursary:
- 34 out of 38 teachers (89%) agreed that the offer of a bursary motivated their school to take part
- 32 out of 38 teachers (84%) agreed that the bursary improved the experience of the event for students
- 29 out of 38 teachers (76%) agreed that the bursary allowed their school to involve more students from underrepresented backgrounds
- 30 out of 38 teachers (79%) agreed that their school would not have been able to take part without the bursary

Figure 4. Teachers views on the bursary's impact (n=38)



Teacher feedback

Feedback on the bursary scheme was collected through the teacher survey and interviews with 6 teachers. The main themes from their comments are summarised below.

General views of the bursary

Most of the teachers expressed gratitude for the support they received throughout their participation in Big Bang at School, both in terms of the bursary itself and the individual staff members who helped organise and plan events.

- "Thank you for the continued support"
- "Thank you for the bursary - it has enriched the STEM fair offer to students"
- "Just wanted to say thank you for the bursary, we very much appreciated the gift"

There is a clear sense of the benefit that teachers feel from receiving additional funds to support their schools' engagement with STEM. Some teachers also mentioned they plan on continuing to participate in Big Bang at School in future years, with hopes of applying for the bursary again.

- "I plan on applying for the bursary next year"
- "If I do not receive any further bursary, it would not stop me running Big Bang at School, but the bursary does help massively"

Use of the bursary

Similarly to what we found through our survey, teachers' comments highlight that funds are used to cover the costs of resources or equipment to enrich their STEM activities.

- "Everything associated with Big Bang at School activities was covered by the bursary, excluding cost for supply cover"
- "The bursary was used to pay for resources for different workshops, last year I used the bursary to pay for facilitators"
- "We have used the bursary to buy basic equipment to enrich science across the school"

Bursary as an enabler for STEM engagement participation

Several comments highlighted how the bursary enriched the Big Bang at School offer, allowed for specific activities to be purchased, and covered certain costs. Some mentioned they wouldn't have been able to run the program without the bursary, while others said they would continue even without

it, though it provides significant help.

- "We could not have paid for the [STEM activity] without the bursary"
- "The bursary makes a massive difference, especially when you have a small budget. It allows us to do things we otherwise would not be able to afford as a small school"
- "The bursary is instrumental in taking part, without this financial support I certainly would not have done Big Bang at School in the first instance last year. This year we got by on a reduced bursary but now knowing the process it is something I would like to continue"
- "As STEM coordinator I have a small budget to work with hence having the bursary was perfect"

Application Process and Experience

Several teachers highlighted the ease of the bursary application process, and some shared that their experiences of Big Bang at School activities were overall smooth. However, a number of teachers pointed out that they were not aware of the bursary or were unsure if they had received it.

- "I don't know whether you've already issued all the bursaries that you have, but this was a chance conversation at an IET sponsored event that pointed me in the direction of the bursary that allowed us to present this to our students"
- "My school has not received the bursary yet"

Conclusions and learnings

Most teachers who received a bursary for Big Bang at School reported that the funds played an important role in motivating and enabling their school to take part in the event and enriched the Big Bang at School experience for their students.

Teachers expressed interest in seeking more funding so that they can continue delivering Big Bang at School in future years.

However, a notable proportion of teachers were not aware of the bursary which indicates that bursary availability could be better communicated to teachers to increase awareness.

ABOUT THE BIG BANG FAIR TRAVEL BURSARY

The aim of The Big Bang Fair travel bursary was to enable more priority schools with high proportions of young people from groups underrepresented in engineering to attend The Big Bang Fair by contributing towards their travel expenses or teacher cover costs.

Priority schools had the choice of two bursary schemes to apply for but could benefit from only one:

- **EngineeringUK (EUK) travel bursary** which consisted of a one-off payment of £500 per school
- **The Great British School Trip (GBST) bursary:** £3.75 per student, catering to a minimum of 30 students per school.

Applications

From February to May 2023, schools could register for the Big Bang Fair. During registration, priority schools had the option to apply for a bursary. Teachers specified which of the bursaries they were applying for, how they would spend the money, and their plan to meet the bursary's objectives.

A total of 141 priority schools applied for one or both of the travel bursary schemes (Table 5). Applications were reviewed and schools were selected at random to receive a bursary, 40 schools were offered the EUK bursary and 23 the GBST bursary.

The 63 schools who received a travel bursary brought a total 2,608 students to the Big Bang Fair.

Table 5. Applications for the Big Bang Fair travel bursaries

Bursary	Applications	Successful
EngineeringUK bursary (£500)	134	40
Great British School Trip (£3.75)	94	23
Total unique schools	141	63

Attendance rates

To evaluate the effectiveness of the bursaries, we compared the attendance rates of schools that received a bursary with those that did not (see Table 6).

Bursary recipient schools did have higher attendance rates compared to other schools (80% for EUK bursary and 83% for the GBST bursary compared to 73% for all schools), however our analysis indicated the association between bursary status and attendance rate was not significant.⁴

Table 6. School attendance rates for the Big Bang Fair by bursary status

Bursary status	No. schools did attend	No. schools didn't attend	Total schools	Attendance rate (%)
Successful for EUK bursary	32	8	40	80%
Successful for GBST bursary	19	4	23	83%
Applied for bursary but didn't receive one	54	24	78	69%
Eligible but didn't apply	53	18	71	75%
Not eligible for a bursary	133	53	186	72%
All schools	291	107	398	73%

⁴. Chi2(4) = 2.95, p = 0.567). The data only includes schools that registered to attend the school days at the Fair, it doesn't include all schools that attended for the finals of the Robotics Challenge or Big Bang Competition.

Average group size

To see if the bursary enabled priority schools to bring more students to the Fair, we compared the average (median) group size between schools that got a bursary with those that didn't (see **Table 7**).

Our analysis showed that for schools that received the EUK travel bursary, the average number of students they brought did not significantly differ from the average number of students brought by all schools attending the Fair. This suggests that the EUK bursary did not have a substantial effect on the group size of these schools.

In contrast, schools that received the GBST bursary brought an average of 10 more students than the overall school attendance average. This difference could be attributed to the GBST bursary's calculation per student, which likely incentivised schools to bring larger groups.⁵

Additionally, our analysis found that one group brought significantly fewer students to the Fair; schools that were eligible for a bursary but did not apply for one.

Conclusions and recommendations

While schools that received bursaries did exhibit higher attendance rates compared to non-bursary schools, our analysis did not identify a statistically significant difference in attendance rates based on bursary status. Notably, schools that applied for a bursary but did not receive one had the lowest attendance rates, which hints at the potential benefits a bursary could have provided to enhance their attendance. However, it's essential to recognise that there may be additional factors influencing schools' ability to attend.

Understanding the decision-making processes within schools and the factors that enable or hinder their participation in events like The Big Bang Fair is crucial. This understanding will help determine whether the bursary alone is sufficient or if there are other contextual considerations to take into account.

In 2023, we encountered a higher-than-expected attrition rate, with 39% fewer young people attending The Fair compared to what we had anticipated, a notable increase from the 23% attrition rate in 2022. To understand this trend, we conducted a survey among those who didn't attend, revealing the main barriers to participation, including coach, parking, and attendance costs, securing staff resources, gaining Senior Leadership Team approval, coach company cancellations, and internal trip organization challenges.

Moreover, it's plausible that embedding the bursary application within The Big Bang Fair registration process may not effectively reach schools that need the bursary the most, as they might be less inclined to consider registering for the Fair initially.

Additionally, it's worth noting that schools that received the GBST bursary, which was calculated per student, brought a larger number of students to the Fair compared to those receiving the EUK bursary, which was a flat sum. This observation suggests that the GBST approach serves as an effective incentive for encouraging teachers to maximize the number of students they bring to The Fair.

Table 7. Median number of students schools brought to the Fair by bursary status

School type	No. of schools	Median group size
Successful for EUK bursary	32	45
Successful GBST bursary	19	55
Applied for a bursary but didn't receive one	54	49
Eligible but didn't apply for any bursary	53	30
Not eligible for a bursary	133	45
All attending schools	291	45

⁵ Kruskal-Wallis test: $\chi^2(2) = 6.475$, $p = 0.0393$. Post hoc Dunn's pairwise tests indicated significant differences in median group sizes between schools that were eligible and didn't apply with schools that were a) not eligible for a bursary b) received an EUK bursary, c) received a GBST bursary and d) those that were not eligible for a bursary. No other pairwise comparisons were significant.

Annex 1 - EDI criteria met by schools who completed the bursary programmes in 2022/23

Bursary scheme	Above average free school meals and minority ethnic groups		Significantly above average free school meals		Significantly above average minority ethnic groups		SEN Schools		Rural schools		Single sex girls school		TOTAL
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Big Bang at School	27	44%	19	31%	6	10%	4	6%	4	6%	2	3%	62
Robotics Challenge	7	37%	4	21%	4	21%	2	11%	2	11%	0	0%	19
Neon	7	50%	3	21%	3	21%	1	7%	0	0%	0	0%	14
The Big Bang Fair	35	70%	9	18%	2	4%	4	8%	0	0%	0	0%	50
The Big Bang Competition	2	25%	1	13%	4	50%	0	0%	1	13%	0	0%	8
TOTAL	78	51%	36	24%	19	12%	11	7%	7	5%	2	1%	153