Heathrow Secondary School Coding Challenge 2018

Evaluation Report

3rd March to 11th May 2018

"Very fun and exciting way to learn about coding and engineering, would love to do it again." **Student at Eden Girls School**

"The resilience and determination that it brought out in some of our lower ability students was amazing to see. Simple but challenging task that included a lot of problem solving aspects valuable to all students." **Teacher at Matthew Arnold School**
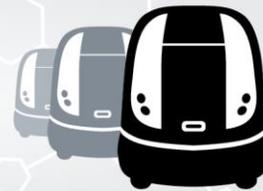
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1.1 Purpose of document

The purpose of this document is to evaluate the impact and benefit to schools and students of the Heathrow Secondary School Coding Challenge 2018 and make recommendations for next year to establish the best route to support secondary schools local to the airport and promote; STEM related subjects, careers in programming and engineering and employment opportunities at Heathrow.

1.2 Background

The Heathrow Secondary Coding School is a series of half day workshops delivered to Year 8 students (12-13 years old) in secondary schools in the 5 priority boroughs around the airport; Ealing, Hillingdon, Hounslow, Slough and Spelthorne. This was the ninth year of Heathrow offering a programme to schools and the third year of the new activity based around coding, an increasingly important area of the curriculum. 21 schools participated over 35 days; the highest number of schools to date (2017; 18). For the first time this year a special session was delivered at Heathrow for Virtual Schools, which are attended by looked after children. The activity was offered to Virtual Schools all 5 Boroughs and young people from Ealing and Hillingdon participated on the 5th and 6th April at an event hosted at the Compass Centre.

Delivery of the Challenge was led by partner Learning to Work, a not-for-profit organisation which delivers educational activities in schools. Students worked in teams to build a 'Pod', and then use coding to programme it to navigate around a track, finishing with an exciting race off with other teams. The pod is based on the Heathrow Pods; Heathrow's Personal Rapid Transport systems between business car parks and T5, which reduces an estimated 50,000 bus journeys per year. This year, the Secondary School Challenge supported the government's Year of Engineering campaign, to get young people interested in STEM careers.

The workshops are designed to:

- Encourage Science, Technology, Engineering and Maths study and careers with an emphasis on coding.

- Introduce students to the Heathrow Engineering Apprenticeship scheme and understand the skills and knowledge required to be an airport engineer.

- Develop skills for the world of work including communications, team working and confidence building.

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The sessions are supported by Heathrow colleagues, which gives students the opportunity to meet and work with people from a major local employer and gain exposure to the work environment.

2. Schools supported

The Challenge was offered to all secondary schools in the 5 key boroughs around the airport in November 2017 and places were allocated on a first come first served basis, whilst aiming to ensure a similar participation rate for each borough.

The Challenge was delivered to the following schools over one and in some cases two days depending on the size of the year group;

	2018	2017
Ealing	Alec Reed Academy*	
	Dormers Wells	Dormers Wells
	Ellen Wilkinson School for Girls	Ellen Wilkinson School for Girls
	Featherstone High School	Featherstone High School
	Villiers High School*	
Hillingdon	Guru Nanak Sikh Academy*	Stockley Academy
	Northwood School	Northwood School
	Oak Wood School*	
	Swakeleys School for Girls	Swakeleys School for Girls
	Vyners School	Vyners School
Hounslow	Lampton School	Lampton School
	Rivers Academy West London	Rivers Academy West London
	Spring West Academy*	Cranford Community School
	The Green School	The Green School
		Isleworth & Syon School
Slough	Churchmead School*	Herschel Grammar School
	Ditton Park Academy	Ditton Park Academy
	Eden Girls School*	St Joseph's Catholic School
	St Bernard's Catholic School*	Upton Court Grammar School
Spelthorne	Matthew Arnold School*	Sunbury Manor School
	Thamesmead School*	
	Thomas Knyvett College	Thomas Knyvett College

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*School didn't take part last year

A total of **3,351** students took part **(2017; 2,891)** across **21** schools **(2017; 18)**. 141 Heathrow colleagues signed up online to support sessions **(2017; 155)** with 124 **(2017; 120)** attending a session including Engineering Apprentices and Managers and IT Managers. Some volunteers cancelled due to changes in work commitments or personal circumstances. Many volunteers covered more than one session committing a total of 92.5 person days (2017; 93). The Challenge is delivered to the whole of year 8 in groups of up to 60 students. Engaging such a large, mixed ability group is a challenge made possible by the commitment of Heathrow colleagues who support and motivate the students. 10 schools that participated this year did not take part last year.

Volunteers are asked when signing up, in which area of Heathrow they work. 141 volunteers provided this information, which is summarised below with answers grouped. 6 volunteers **(2017; 8)** indicated that they were apprentices

Area of Heathrow	Number of volunteers booking
Baggage	6
Commercial	6
Communications	1
CRS - VIP	1
Development	11
Engineering	18
Expansion	25
Finance	2
Health and Safety Improvement Team	1
Heathrow Employment & Skills Academy	3
Heathrow Express	4
Human Resources	5
ID Centre	1
IT	24
Procurement	3
Security	2
SRR	1
Strategy	5
Surface Access, Future Heathrow, Expansion Programme	2
Sustainability & Environment Team, SRR	3
Terminal 5	1
Water Services	1

3. Press and Social Media coverage

The sessions were tweeted on @yourheathrow every time the Challenge went to a new school. Tweets were viewed 61,495 times, with a total of 46 retweets and 100 likes. The hashtag #YoE was used to promote the government's Year of Engineering campaign.

Some examples of social media activity during the Secondary School Challenge:

Press Coverage

The Secondary School Challenge was covered by the Slough Observer and Slough Express on International Women's Day. There was also a press release from Heathrow to cover the day.

See Appendix 1.

2018 Secondary Challenge Evaluation Summary

4.1 Students
1,333 students completed an anonymous, evaluation survey (2017 1,361). The online link to the survey was sent to the school the day after they participated in the session. Students from all schools taking part, except Matthew Arnold and Springwest completed evaluations. Schools that didn't complete evaluations were chased twice by email and once by phone. Teachers were asked to confirm when booking that they would arrange for the evaluations to be completed. Thamesmead School advised that it could not complete the evaluations online, so paper copies were completed, collected and manually loaded onto the survey programme.

Students were asked to assess; the various engineering and coding challenge activities, the Heathrow volunteers and the day over all. A summary of their responses is shown below.

HEATHROW SECONDARY SCHOOL CODING CHALLENGE

What did you think of;	Excellent	Good	OK	Poor	% Excellent or Good 2018	% Excellent or Good 2017
Activities involving the Robot?	52%	32%	12%	4%	**84%**	84%
Activities involving programming the robot?	41%	37%	16%	6%	**78%**	71%
Final robot race off	51%	26%	16%	7%	**77%**	75%
The Heathrow volunteers?	49%	33%	13%	5%	**82%**	83%
The team leading the workshop?	51%	32%	12%	5%	**83%**	82%
The day overall?	47%	35%	14%	4%	**82%**	81%

Almost 80% of students who participated rated the activities as Excellent or Good. Over 80% rated; the volunteers, activity lead and the day over all as Excellent or Good. Scores are similar to last year, with the exception of that for activities involving programming. This increased to 78% **(2017; 71%)** rating it as Excellent or Good. This was the third year of the new activity, so the higher rating for the programming may be the result of fine tuning based on the results of last year's evaluation.

The high rating of the volunteer support by students; 49% excellent and 83% Excellent or Good shows that volunteers were committed to the task of supporting students and their help was greatly valued.

Students were asked 'what have you learnt today?' The majority of answers refer to the practical learning; building a robot; 579, and programming or coding; 740, which shows the programme supports the area of the curriculum targeted. There are also comments about; team working 86, understanding what STEM is; 50 and learning about Heathrow; 113. No students referenced apprenticeships, so this may be an area to particularly highlight in future.

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Selection of typical comments from students;

That STEM stands for science technology engineering and maths
How to build a robot with my team and learning more about engineering.
how to program a robot
I have learnt that coding is easy when you simplify and slow down the way to program the robot
I learnt that teamwork means a lot in engineering.
I learnt how to program the robot and about the future cars.
I learnt how fun programming and building is.
How to code and build a robot.
I've learnt how to properly program a robot.
How to properly program build and race a robot and how to work as a team .
That there are a lot of jobs out there to do something with coding
Why programing is important and how we use it in our everyday lives.
A lot of people work in Heathrow for our benefits too
that you have to talk to your team
I have learnt about the technology of the Heathrow Air Pods.
I have learned how to program and also learnt about all the opportunities at Heathrow

Today I learnt teamwork is really important and working and helping each other is very useful. Life is not that easy as I thought at the start. S.T.E.M day is a wonderful experience for kids my age to go through. This is because I learnt a lot of things I never knew before
Hard work and teamwork is key to victory no matter who your working with.
The basic steps to program a robot. Also the types of jobs involved in Heathrow.
On Thursday, I learned how to use trial and error for coding.
How to code
how to program a robot
I have learnt how to programme the robot
I learnt what type of jobs require programming in the real world.
I've learnt how to code and how to assemble a robot.
I have learnt what jobs you can do in Heathrow
I have learnt the importance of a team.
I learnt how to program a robot

The comments indicate that the project is succeeding in promoting the importance of coding and programming and increasing awareness and interest in Heathrow. An increased focus an highlighting of apprenticeships may be beneficial to raise awareness of that amongst students.

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Students were asked; Has today's session made you more likely to consider careers in engineering or technology?

	2018	**2017**
Yes	**58%**	60%
No	**42%**	40%

A key aim of the programme is to motivate students to consider careers in engineering and technology to encourage them to continue to pursue STEM subjects. 58% of students agreeing that they are more likely to consider a career in engineering or technology, as a result of taking part in the Challenge, is strong evidence that the programme is achieving this aim. It is a similar percentage as last year.

Comments from the students on the day overall confirm the effectiveness of the programme in making STEM subjects interesting and relevant to students. They also show that students enjoy taking part and that the support of the delivery team and volunteers is key to the success of the session.

Students comments on the day overall

It was a really fun day and I learnt a lot! I hope that the Heathrow volunteers and robot-making activities come again soon, so the finalists of the robots can compete again.

it was a fun and good day.

it was a very fun experience and i learned quite alot, as a group and as a individual student

It was extremely fun and we learnt a lot of new things

It was an interesting experience to do something different

Excellent day should repeat

I enjoyed making my robot with my team and loved the part when we raced with other robots

It was excellent. The excitement during the race and the atmosphere was incredible! To be able to communicate with your team is essential, and the competition was immense! The staff were great help, aiding us in any way they could! They were friendly and helpful.

I really enjoyed the day and I'm glad I took the opportunity.

The day was a very excellent session which has a really good understanding on the Heathrow pods. Amazing

Educative and fun day. I had recieved a lot of helpful information for the jobs available in the future and the overall activity was engaging.

it was quite a fun time and was able to learn quite a lot the coding also designing with the programming

very good and very nice and helpful staff

it was excellent

it was awesome

it was good

I enjoyed the final race

It was very fun. The team members were extremely nice and helpful. And it would be lovely to do something similar next time. Though it was very fun

I would love to have more days like this.

It was a good day and I learnt a lot and had a lot of fun

Yes very good day we enjoyed thank you for your visit at our school and teaching us about stem

The staff were really kind

The day was very interesting as we took enough time for powering the robot and coding it as well.

The day was fun and challenged us to tackle the challenges. It also made me realize how good I am at science, technology, engineering and maths.

It was very fun and it taught us a bit of everything.

I would like to do the same activity next year as well

The experience overall was very creative , enjoyable and something different. It was great fun.

It was a good and fun day

no comments except it was really fun and I enjoyed it

4.2 Teachers

47 teachers and support staff completed an online evaluation of the project. Teachers from all 21 participating schools responded. In addition, two teachers from the Hillingdon Virtual School completed evaluations. Teachers from the Ealing Virtual School did not complete an evaluation, although requested and reminded. The responses from the two Hillingdon Virtual School teachers are attached Appendix 1. The Virtual School teachers differ in their assessment of the value of the session and whether they would participate again. Only one student attended, which may have made assessment difficult, the student did not complete an evaluation although the link was sent to the teacher.

There is clear evidence from the feedback from teachers that the project supports the STEM curriculum and is valued by schools.

Teachers were asked;

How relevant did you find the challenge to STEM studies?

	2018	**2017**
Very	**83%**	70%
Quite	**17%**	30%
Not relevant	**0%**	0%

83% of teachers responded that the programme is very relevant to STEM studies, a significant increase on last year, in 2016 the proportion was 68% with 4% saying it was not relevant. It would seem that there is a growing awareness amongst teachers of the importance of coding within STEM.

Teachers were invited to expand on their answer, 4 did;

Great that you link to a real life scenario at the airport.
Its a growing technology that as a school we do very little of
The students will not get an experience like this in their normal school day. Really valuable.
We do some coding in school but the students do not always see the relevance.

What did you think of the student interest and participation during the event?

	2018	**2017**
Excellent	64%	**67%**
Good	36%	**31%**
Okay	0%	**2%**

Scores are slightly higher than for last year's activity with 100% of teachers rating student participation excellent or good (2017 98%). Although slightly fewer rated it as excellent.

Teachers were invited to expand on their answer, 7 did;

90% very engaged

Clearer instructions to help groups who have navigated the track to help refine the performance of their pod.

He was very keen to get to the end of the course and win the race! (Hillingdon Virtual School)

Some were excellent.

Students love it.

Very few students were not engaged. Almost all had a smile on their face as they approached their challenges.

Teachers were asked;
"How would you rate the delivery of the session?"

	2018	**2017**
Excellent	83%	51%
Good	17%	47%

The scores are significantly higher than last year, with 83% of teachers rating the activity Excellent, which is very impressive. The programme is in its third year, so it may be that assessment and continual improvement has addressed any initial weaknesses.

Teachers were asked what the strengths of the project were;

It is very engaging. It is the most engaging for the majority of those that take part compared to other challenges I do

They adapted well to our very low numbers in the group. Was nice that is was hands on and the young person got a lot from it. (Hillingdon Virtual School)

Learning something that personally I had not done before, I think that it will be the same of many of the young people who attend. Very enjoyable, learning in a practical way.

team building exercise, demonstrating resilience and passion to achieve.

Active learning, building , coding, and seeing the results

Application of STEM subjects

Engaging

Team work

Collaborative working between the staff and students present.

Giving the students a broaden experience of the different jobs available in a variety of sectors (I only saw the first 15 minutes)

Team work and perseverance of pupils

The students really enjoyed the day and the support provided was excellent

Group work for students, the coding challenge and resilience regards trial and error.

Making coding and programming interesting and challenging to the students (very hands-on).

The fact that it was relevant and interactive.

Interesting and fun

Good presentation and technical support during the event

allowing the children to work as a team and use trial and error methods.

Not sure.

Excellent engagement!

The competition element along with the practical task of coding the robot and the trial and error element to it.

Lots of opportunity to either advance the robots or keep it simple depending on the level of students

Range of active that encourages engagement

Interactive, fast paced, relevant, though provoking for students.

Learning to work were very organised and delivered to the minute of the planned schedule.

Interactive and appropriate for all - boys loved it and the girls did even better than the boys - we loved it

problem solving student engagement career link

It engaged all students and the competition element of the activities was something all the students enjoyed and motivated them.

The fast paced activities

Students being put to work in pre chosen groups to develop team work skills.   Trial and error situation to encourage perseverance.

Using team work and a variety of skills and a competition at the end.

Going through the whole process and having a tangible reality at the end that linked all the parts together.

The students were engaged throughout and challenged in the task

An engaging and exciting event.

Practical and kinaesthetic. Teamwork required for successful completion.

Engaging content, discussion of job prospects.

practical learning- teamwork skills

Something different to what students normally do, and very hands on, which is great.

The resilience and determination that it brought out in some of our lower ability students was amazing to see. Simple but challenging task that included a lot of problem solving aspects valuable to all students.

Engaging idea for students.

Interactive and very engaging

Team working

The activities and resources

Very active - apart from the first 30 minutes, students were actively doing something at all times

Hands on and using skills that the girls have come across before, but encouraging them to think and apply this to more specific situations

Teamwork and delivery. Super equipment to work with. Working towards a final goal. Group work and interaction.

Opportunity to use programming skills. Opportunity to practice team work

The feedback provides strong evidence that the Challenge is very effective in engaging students; motivating them to persevere in a coding task and understand the relevance of it to future careers. Team working and the need for resilience and determination to succeed through trial and error is referenced a few times indicating that this element of the learning is being strongly conveyed.

Teachers were also asked how the session could be improved

A harder course and a battle off of the winners, ie we had 4 sessions so 4 winners

Maybe if there has been some 'pre-loaded' programming for the robot and it was about adapting it to make it work. This may be more accessible for some of the students who didn't get it.(It may also have helped with the timing of the event)

Maybe just a little more time explaining how to navigate using angles through the maze.

More time given on event.

I could have had a larger hall

Activities to suit all abilities

More laptops available for students to program with

Engaging girls

Unsure

N/A

Making it more diverse in terms of content

The code videos displayed at the beginning, whilst relevant, are getting old now.

N/A

Couldn't think of any ways to improve it, it's excellent.

It runs really well as it is!

Smaller groups

Modelling different stages of assembling the robot

More time.

Not sure.

n/a

Hard to say. Thought the task was excellent!

maybe if forward planning could be made to distinguish top set students, then we could give them the opportunity to explore more, as they work a lot quicker

A differentiated resource or activity for less able students

Struggling with this one. Possibly ask the Heathrow volunteers to outline their career path to the whole group when they introduce themselves. This does, however, reduce the amount of time students have to do the Challenge.   If it remains unchanged it would still be an excellent event.

Better information regarding Heathrow visitors, as we had more turning up than the names initially provided.

Different groups working on different robots?

I couldn't comment as only their a short while

A points system running throughout the challenge, where students can develop points for good team work, leadership, communication etc.

Longer sessions

N/A

Maybe have something for the faster teams to do or read when they have finished.
Follow up event for the winners as well as web activities they can carry on with in an extracurricular STEM club.

More done by the volunteers when students were back and forth from race track to lap tops - they seemed more interested in ensuring the track was not broken

More Industry experts to explain their role in STEM careers.

Coding language could comply with exam requirements.

Some students were still not entirely clear about what was expected of them after the initial introduction.

scaffolding to some of the instructions at the top of activities

Maybe more information about the types of jobs available at Heathrow, to appeal to students not interested in coding.

Not sure it could.

Different levels of difficulty.

We found it excellent so could not suggest improvements

Less talking at the beginning

none

Motivation and group work was lacking by the end of the activity - could they rate their performance as a group or complete a group self evaluation, to ensure they learn from this experience?

Unsure, as I only was able to attend the first half of the session and I thought it was great.

Difficult because it's already so good. One thought -display a timer to focus how long groups have to work on a task.

For bottom set students the task was harder and therefore more difficult to engage them throughout the task

Comments cover a variety of issues, none of which seem to highlight serious problems. The only recurring theme seems to be around the time available for the session being short. The session in some schools was shortened to accommodate the school day so this will have reduced the time available is some schools. 100% of teachers rated the delivery Excellent or Good, with 83% rating it excellent, demonstrating that despite some requests for adjustments the Challenge is highly regarded.

98% of teachers asked, "Would you do this activity again?" answered "yes" (2017 96%), 2% answered maybe.

Teachers were invited to comment and two did;

Definitely will want to make this a permanent feature I our school calendar.
I definitely would like you to return and go to the Boys School next year- we will have year 8 by then

4.3 Volunteers

141 colleagues volunteered to support the Challenge, a slight decrease from last year **(2017; 155)**and 124 attended a session **(2017; 120),** so a smaller proportion of volunteers who had signed up were unable to attend on the day. 66 volunteers completed an evaluation survey **(2017 - 74).** A volunteer responded from every school visited apart from Oakwood School, where only one colleague volunteered.

Volunteers were asked;

What did you think of the support given to you before the event?

	2018	**2017**
Excellent	42%	53%
Good	52%	44%
Average	6%	3%
Poor	0%	0%

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Suggestions to improve the support were;

As the session was for year 8 students, it could be tailored to be more interesting for them. It felt a bit too corporate and students were switching off.

Could put the time to start at the school in the title or location to give a clearer guide as they do differ between schools, minor point as it is within the invite content

Further details of the timing of the sessions

I feel if we knew exactly what we were doing and had some familiarisation with the program we could be more helpful

I had enough to go on. Thanks

Information about parking, lunch and accurate information about dress-code. Possibly some info on what the task was.

Information of what to expect, what is the day going to look like. Also, the invite said start at 8.20am but the session only started at 8.50am

Invites and joining inst schools ructions good. Training sessions were available.

It would have been useful to receive further details regarding a high-level itinerary for the session, suggested arrival time to the school, car parking arrangements, refreshments arrangements etc.

Nothing - plenty of inductions and pre-advice.

Nothing noticed

Quick video of a prior event

Ration of students to time available could be better

The address and post code was incorrect and meant we were late.

The directions could have been better ... the directions were cut off in the information.

The postcode given for the school was not recognized by my sat nav and I therefore ended up in completely the wrong place initially.   The school is relatively newly built and therefore written directions (on this occasion) would have been helpful until the post code is recognized.

The pre-preparation meeting was not communicated to all attendees.

To advise who we are meeting with from the school would have helped when registering at the school

94% of volunteers rated support before the event Excellent or Good, with 42% rating it Excellent. Scores are lower this year, although no significant changes were made.

There are recurring comments about difficulties with the address details for a couple of schools. The address is provided by the school, when booking, and it is explained on the form that it should be the address for where delivery of the session will take place. Two schools were in new buildings, with a new address; Swakeleys School provided instructions, as well as an address, which was included in the brief and diary invite. Ditton Park Academy was also on a new site, but didn't advise that when booking and the post code wasn't recognised on sat nav.

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Guru Nanak School had specific requirements for dress and this was included in the instructions and diary invite, but may not have been seen by some volunteers;

All volunteers receive a diary invite with briefing notes attached and a confirmation email is sent out at the start and re sent as volunteers sign up. Volunteers carry on signing up as the delivery starts, right through to the end, volunteers also email to cancel or change sessions. This may mean that some miss the confirmation email.

The start time for the session is on the diary invite and the breakdown of the timings is on the confirmation email. The instructions seem to be confusing to some volunteers however, so it may help to include in the diary invite that the session start allows for a half hour brief before delivery.

What did you think of the support given to you during the event?

	2018	2017
Excellent	64%	53%
Good	34%	43%
Average	2%	3%
Poor	0	0

Suggestions to improve the support were;
Again keep doing great work
Colleagues from Learning to Work were brilliant - very knowledgeable and shared the process and objectives for the day which was useful.
For us to really help - we should get to build the car ourselves and be habituated to the coding (no more than an hour prep in total)
It would help if there was a short guidance note for the volunteers with the common pitfalls or frequently asked questions. For example, I did not think to reboot the robot when it failed to respond to commands and spent quite a bit of time with the student trying to identify an error in their code.
Might be better to have a booklet made up with just the steps the kids are going to do, and to remove the part showing the 3rd network cable into the head as it does seem to confuse the kids at the sessions I've been to
None - just encourage more volunteers to attend as it is such a rewarding event
Very well organised and enthusiastic so no improvements required.

What did you think of the student interest and participation during the event?

	2018	**2017**
Excellent	57%	44%
Good	40%	44%
Okay	3%	8%
Poor	0%	4%

The rating by volunteers of student's interest and participation is high with 97% rating it Excellent or Good. The "Excellent" rating is significantly higher than last year and no volunteers rated it poor. A great achievement.

What did you think of the Team delivering the challenge workshop?

	2018	**2017**
Excellent	78%	66%
Good	20%	30%
Okay	2%	4%
Poor		

General comments

They had a brilliant manner - firm yet engaging - and shared the work between themselves which kept the students engaged.

Great team, passionate about what they're doing and made it a fun day for all involved.

Nil

None - all were really good and interacted well with students

None.

Perhaps open with more of a discussion and encourage more participation from the students although I realize time can be limited. The presentation on the Heathrow PODs is dated although this is probably only noticeable to Heathrow colleagues. I suggest checking the fact about the number of bus journeys avoided as I recall this being inconsistent between video clip and the text read out by the instructors (from memory 50k v 70k saved).

Sorrell and Linda were superb on the day. Couldn't have been more friendly and helpful.

The team is really great and do such a good job of controlling very excited children. They also engage with the children really well.

The team really engaged with the pupils and managed the session very well.

The team would benefit from smaller and lighter equipment i.e tablets instead of laptops. Also, somewhere to store equipment in a secure location between events, a small van that didn't have to be loaded and unloaded each night.

There were definitely too many children for the size of the room - would be better in slightly smaller individual groups (eg 4 rather than 6 per group), but also would benefit from more space for the race track set-up.

very inspiring and able to engage with the kids.

Well prepared. Dealt with issue's promptly and efficiently. Well-presented and delivered.

The comments about the delivery team are extremely positive again this year. An impressive 78% rated the team as excellent **(2017; 66%)**

Would you volunteer again?

	2018	**2017**
Yes	**100%**	95%
No	**0%**	2%
Maybe	**0%**	3%

Engineering UK evaluation questions

This year, questions that were provided by Engineering UK (EUK) were included in the student and teacher surveys. They are question that EUK uses when evaluating its own events in schools and encourages other organisations delivering STEM events to also use, to gather a broad database of information. The questions are not an evaluation of the activity. They assess the attitude of students and teachers to STEM related careers and teachers confidence in giving advice on STEM careers. A summary of responses, which were shared with EUK is included in appendix 2.

5. Challenges

Raising awareness amongst students of apprenticeships seem not to have been fully effective this year; no student referenced apprenticeships in the feedback. The message could be strengthened in next year's presentation.

Virtual Schools were invited to participate this year for the first time and additional sessions, at the Compass Centre, added to the programme to accommodate them. The inclusion of the schools was planned after the project had started and two dates were initially proposed and then reduced to one. The invitation was sent via one lead for the 5 Boroughs and then to a contact in each Borough. This led to some confusion over dates and there was not take up in every Borough; only Ealing and Hillingdon took part and only one student attended from Hillingdon. Two teachers from Hillingdon completed an evaluation and no student evaluations were completed. The feedback from the Hillingdon teachers varies, with one positive and one not. It may be helpful to discuss with all teachers what the barriers to participation may be and to explore how the session could be made more accessible to Virtual Schools.

There were slightly fewer volunteers signed up this year; 141 (2017; 155), after steadily increasing each year from 101 in 2015, but still good support from colleagues. There was also a lower dropout rate, so more volunteers attended a session; 124 (**2017; 120.**) Some signed up late, sometimes just before delivery, so were not able to attend the briefing session. Having volunteers signing up once delivery has started presents challenges in needing to send multiple emails to schools to advise attendees names and re sending diary invites and confirmation emails. This can mean that schools are not expecting some volunteers and that volunteers miss the confirmation email.

A small number of volunteers found the instructions on the timing of the session, particularly the diary invite, confusing, as they were unsure whether the arrival time was the start of the delivery or the time to arrive for the brief. A note could be added to the heading in the invite to say the arrival time allows for a brief.

As in previous years, there were a few volunteer cancellations, although fewer than last year, but all schools this year had at least one volunteer. Volunteering, is subject to operational requirements, cancellations were due to project demands, illness, bereavement and covering shifts. The volunteer brief includes information on the crucial nature of volunteer support to the success of the sessions. Volunteers are sent a reminder two working days before the session, as well as being sent a diary invite and briefing notes when they sign up.

Having the Spelthorne and Slough sessions early in the programme worked well in allowing more time to recruit volunteers for the Ealing and Hillingdon sessions, which tend to be less popular. So this should be repeated.

Engaging schools was easier this year, although this had been a challenge last year. The initial target was to have 20 schools, 4 from each Borough and an increase on previous years. 21 schools were signed up and took part. Last year although the target was 20, only 18 schools took part. Offering schools the option of a two hour session helped, Thamesmead School, which dropped out last year because it couldn't make a two and a half hour session work, took part this year. The invitations to school was also sent out earlier, mid-November rather than December, giving schools more time to respond before the end of term.

6.   Summary and recommendations for 2019

This was the second year of the new coding based Challenge and it was again well received by students and teachers. There is strong evidence that it achieves its aim to;

- Encourage Science, Technology, Engineering and Maths study and careers with an emphasis on coding.

- Introduce students to the Heathrow Engineering Apprenticeship scheme and understand the skills and knowledge required to be an airport engineer.

- Develop skills for the world of work including communications, team working and confidence building.

Students more likely to pursue a career in engineering or technology

	2018	**2017**
Yes	**58%**	60%

Teachers rating the programme's relevance to the STEM curriculum

	2018	**2017**
Very relevant	83%	70%

Volunteers rating students interest and participation in the session

	2018	2017
Excellent	64%	44%
Good	36%	44%
Okay	0%	8%
Poor	0%	4%

Recommendations for 2019

- Ensure the invitation is sent to schools by mid-November, before schools start winding down for Christmas to help ensure good take up.
- Review the way the dedicated Virtual Schools sessions are structured with the leads in each Borough to identify how they can be made more attractive and accessible to young people.
- Consider how to reinforce the message about apprenticeships to ensure that it is picked up by students.
- Add a message to the diary invite, that the arrival time allows time for a brief prior to delivery of the session; half an hour for the morning session and 15 minutes for the afternoon session

Kathleen Healy
31th May 2018

HEATHROW
SECONDARY SCHOOL
CODING CHALLENGE
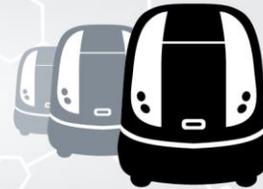
App 1. Summary of press coverage

'You can follow dreams'

Business community inspires our women students

By Greg Taylor
gregory.taylor@newsquest.co.uk

THE HEAD of the regional chamber of commerce has visited young women across the area to inspire them as part of International Women's Day.

Nancy Lalor, CEO and Vice-President of the Slough Chamber of Commerce visited a number of businesses and schools around the town to build stronger links between business and education, starting with the Mars factory, where she met and spoke to 40 young girls studying Science, Technology, Engineering or Maths (STEM) subjects in Slough schools. The students asked women staff about their journey to the positions they were in.

Ms Lalor said: "With the focus this year being "Press for Progress" there has never been a better year to bring together our future female workforce

and ambassadors from Mars, enabling student's to hear first hand about the many career paths that await them.

"The team said they felt nurtured by Mars, but said there was still a long way to go. The students really took the lead with the questions, I'm so pleased they embraced the

Students from Eden Girl's School doing a Lego Mindstorms event with Heathrow Staff

message.

"My view is – if we can't see, we can't do it. That's why we need to showcase women in these positions."

Ms Lalor then visited Eden Girl's School, where Year 8 students were participating in the Heathrow Secondary Schools challenge. Students worked alongside Heathrow volunteers to build Lego Mindstorms robots – which require programming to do things – and then raced them.

She then moved on to Baylis Court Girls School, where Year 10 students were participating in a 'Work Ready Day', organised by a number of businesses to give useful advice and guidance on customer service, the structure of a business, and diversity in the workplace.

Ms Lalor said: "This is a great way to motivate and inspire young people about their futures, bring careers advice to life and embed the message that anything is possible if you follow your dreams."

2018. THE YEAR OF
ENGINEERING

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ouncil funding

based Dash loses contract to London organisation

.co.uk

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Domestic Abuse
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Girls go high-tech for International Women's Day Full story p4

on   Google

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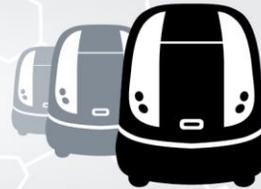
Tributes paid to club stalwart

SLOUGH: A long-time and popular Slough Town FC fan has died after suffering a stroke at a match at Arbour Park last month.

Dave Carpenter was taken away in an ambulance on Saturday, February 24 as the Rebels' played against St Neots Town FC. He died on Thursday, March 1.

The Rebels praised Dave for introducing the club's PALS disability team, which was a runner-up in the Get Berkshire Active awards, which Dave attended the day before his stroke.

He also volunteered at the club, manning the officials' entrance.

The club added: "His passing has left the players and their parents and carers extremely upset as he did so much for so many people.

"We will miss his cheery presence around Arbour Park and our thoughts are with Dave's family at this time."

Slough Borough councillor Rob Anderson saw Dave being taken out of the stadium.

"He was a real stalwart of the club, he'd been watching Slough since the 1960s," he told the Express. "There aren't many people who have been watching Slough as long as he has."

Girls take challenge set by Heathrow

Slough: Tech event also marks International Women's Day

Students at Eden Girls' School taking part in the 2018 Heathrow Secondary Schools Challenge. Ref:129503-2

By David Lee
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@DavidLee_BM

Heathrow Airport celebrated International Women's Day by launching its Secondary School Challenge at Eden Girls' School.

Engineers from the UK's busiest transport hub visited the Islamic faith school, in Bath Road, yesterday (Thursday) to encourage more girls to learn about engineering and technology.

Students had a go at designing their own mini Lego versions of the airport's PODs which transport passengers between Terminal 5 and the business car park.

The challenge also saw them learn about coding as part of the Government's Year of Engineering programme.

Sundeep Sangha, Heathrow's head of economic development, said: "Our industry is evolving and the more women we have across the airport will set us on a path to becoming a truly great place to work."

Karim Murcia, principal of Eden Girls' School, added: "Taking part in the challenge saw them get hands-on experience through an activity that was fun and exciting, while also highlighting how the skills they develop through studying STEM subjects can set them on a path to a rewarding career."

Speed read...

Students designed their own Lego robots as part of the Heathrow Secondary School Challenge. The event also marked International Women's Day.

From left, Maira Ali, 13, Kajaany Sivakumar, 12, Leyla El-borkari, 12, Asli Mohamed, 13, and Hajara Chapra, 12. Ref:129503-10

App 2. EngineeringUK

Student Questions

Which of these words would you use to describe a job in engineering?

	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot
I know what to do next in order to become an engineer	9.71%	15.18%	26.71%	20.98%	27.43%
Taking part in this activity has inspired me to want to work in engineering in the future	4.52%	8.33%	14.62%	18.49%	54.03%
Maths is important for all careers	13.89%	19.58%	23.41%	18.32%	24.80%

How positive or negative is your view of each of the following?

	Very negative	2	3	4	Very positive
Science	6%	9%	26%	28%	31%
Technology	5%	10%	26%	26%	33%
Engineering	8%	13%	27%	25%	26%
Maths	9%	12%	24%	24%	31%

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CODING CHALLENGE

How much would you say you know about what people working in the following areas do?

	I don't know lot	2	3	4	I know a lot
Science	12%	14%	30%	27%	16%
Technology	11%	15%	32%	27%	15%
Engineering	14%	18%	29%	23%	15%

How desirable do you believe a career in the following areas to be?

	Not very desirable	2	3	4	Very desirable
Science	13%	13%	27%	21%	26%
Technology	12%	13%	28%	26%	21%
Engineering	14%	14%	28%	22%	21%

Teacher Questions

How desirable do you believe a career in the following areas to be for your pupils? Please choose a number from 1 to 5. 1 would mean not very desirable, 5 would mean very desirable.

	1 Not very desirable	2	3	4	5 Very desirable
Science	12	7	26	42	13
Technology	9	4	19	38	30
Engineering	9	14	28	37	12

How confident do you feel giving careers advice in the following areas? 1 would mean not very confident, 5 would mean very confident

	1 Not very desirable	2	3	4	5 Very desirable
Science	14	28	226	23	9
Technology	16	30	30	15	9
Engineering	17	31	28	18	6

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