

November 2021

The Invisible Internet Zone (<https://internet21.imanengineer.org.uk/>) ran from 1 November to 10 December and was funded by **techUK** and other internet infrastructure companies.

The Zone featured engineers responsible for building, improving, and maintaining the systems that keep us connected with the rest of the world.

Throughout November, Covid-19 cases in schools remained at an all time high. This meant there was less activity within the Zone than expected.

Key activity figures

	Zone	November 2021 average
Schools	9	8
Students logged in	275	221
Students active	97%	91%
Engineers	32	23
Questions asked	37	35
Questions approved	19	23
Answers given	130	110
Engineer comments	5	3
Live chats	18	14
Lines of live chat	6,331	4,374
Average lines per live chat	352	297
Votes cast	150	104

Engineers

32 engineers created a profile in the Zone.

You can see who took part at

<https://internet21.imanengineer.org.uk/engineers/>

The winning engineer with the most votes from students was **Femi Olushola**, Senior Electrical Engineer at VIRTUS.

Students

275 students from 9 schools across the UK logged into the Zone.

75% of active students were from target schools: 11% from underserved schools and 64% from widening participation schools.

Live chats

18 live chats booked by teachers for school classes took place during the activity. Additionally, there were 2 chats scheduled, open to all the students.

An additional 3 live chats were booked: one was cancelled and in two the school was unable to attend without cancelling.

It is common for students to share login details or computers during live chats. Therefore, the number of students reached will be higher.

School activity

Students from 9 schools across the UK participated in the Zone. In addition to live chats booked by teachers, there were 4 Thursday evening chats scheduled for the students and their families.

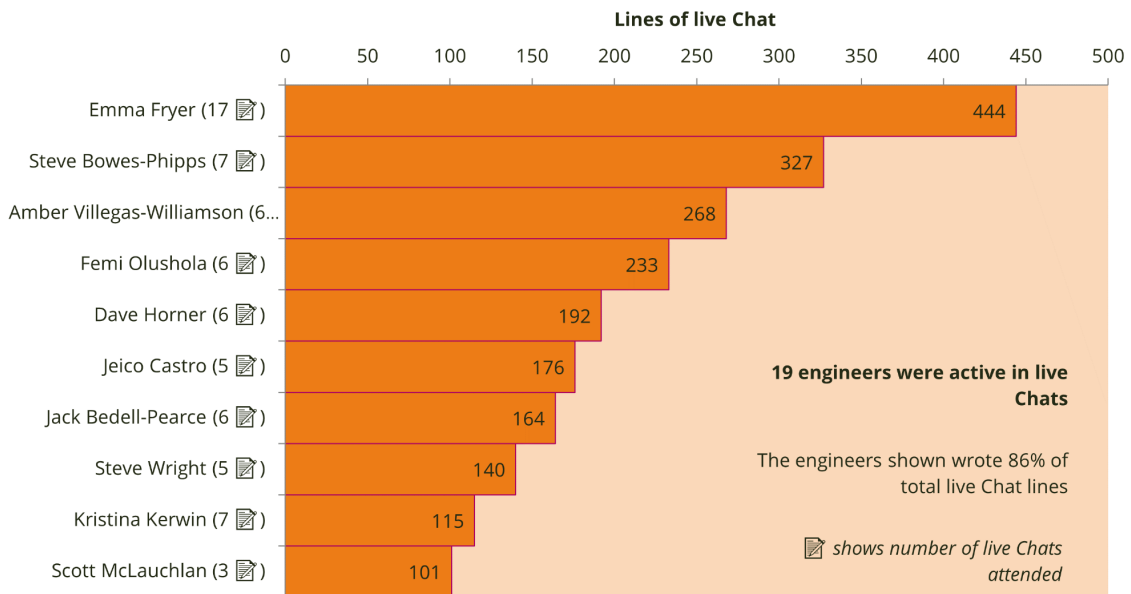
School	WP/U status	Active users	Chats attended	Chat lines (total)	Chat lines (per user)	Questions approved	Votes
Hornsey School for Girls, London	WP	140	7	1,927	14	8	79
The Hawthorns School, Redhill	-	62	5	1,222	20	4	51
Trinity CofE High School, Manchester	WP	29	1	250	9	5	0
Mallaig High School, Highland	U	14	1	107	8	1	9
ST Edwards N S, Sligo	U	12	1	169	14	0	9
Fakenham Academy Norfolk, Fakenham	U	7	1	53	8	0	0
Pennthorpe School, Horsham	-	4	1	68	17	0	0
Dagenham Park CofE School, Dagenham	WP	3	1	37	12	0	1
Hills Road Sixth Form College, Cambridge	-	1	0	0	0	1	0

We want to increase the participation of under-represented groups. Find out what we mean by under-served (U) and widening participation (WP) schools, and how you can support us in working with more of these: about.imanengineer.org.uk/under-served-and-wp

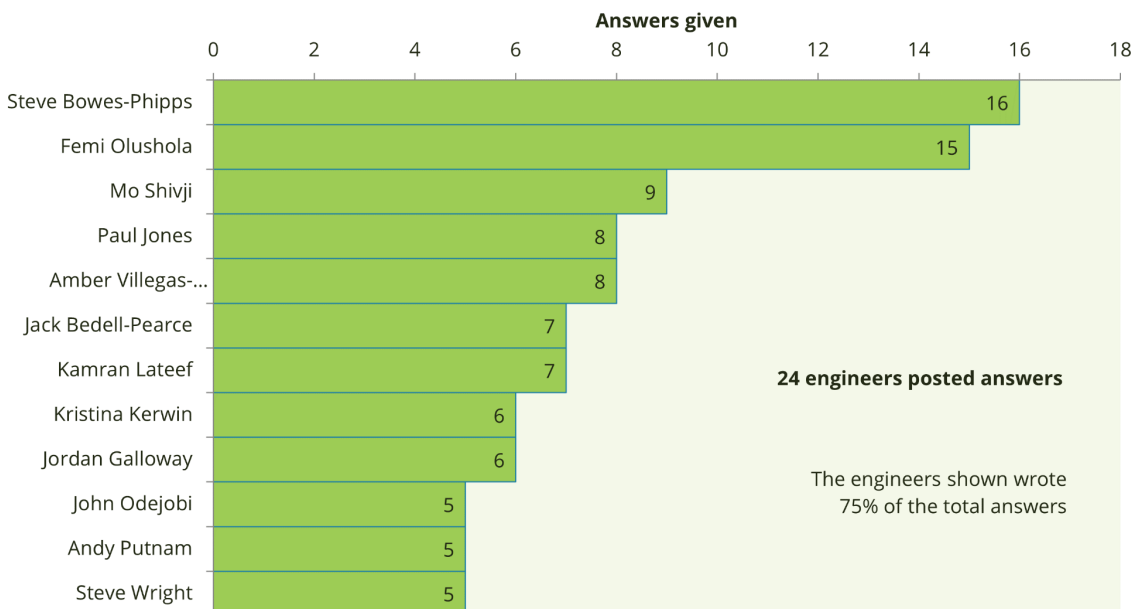
Engineer activity

During the Zone the engineers interacted with students by writing 2,498 lines of live chat, and providing 130 answers to 19 posted questions. On average, 3 engineers attended each live chat.

10 most active engineers in live Chats



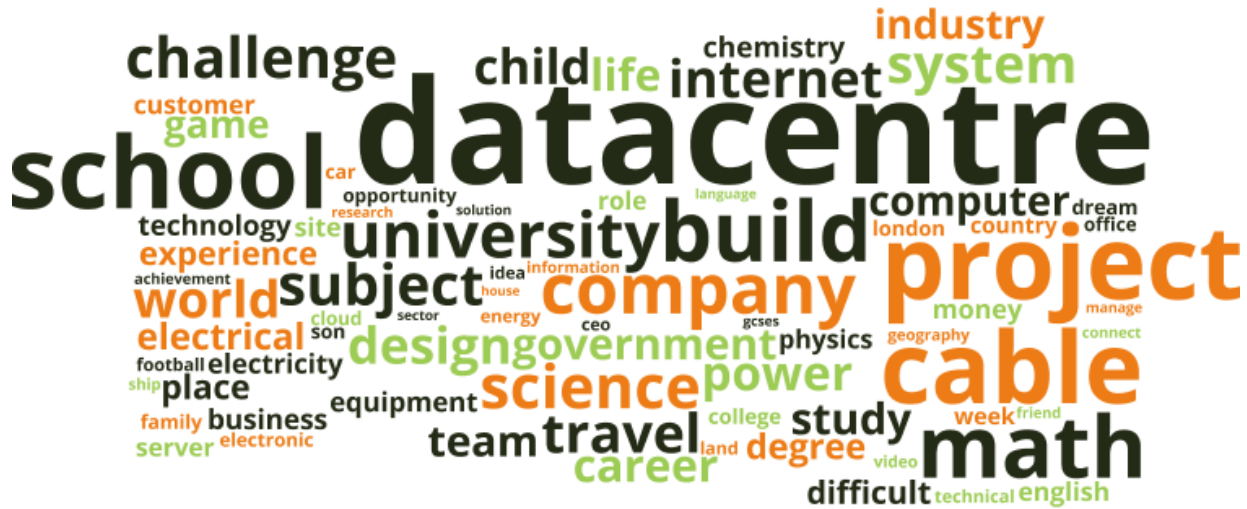
10 most active engineers in posting answers



Funded by:

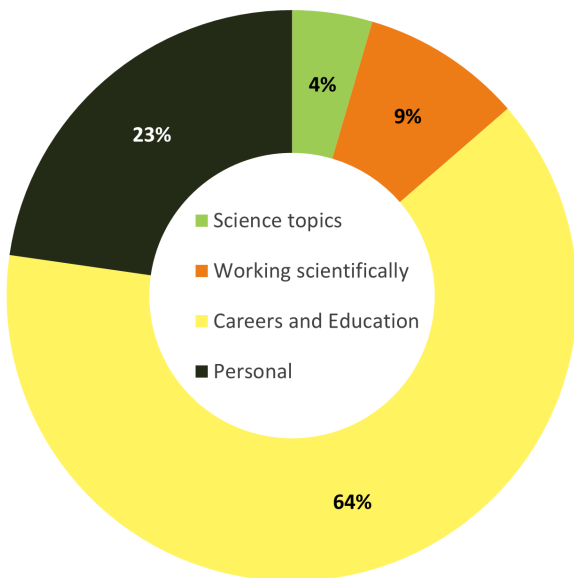
Live chats

The word cloud below demonstrates what students and engineers talked about in live chats. The bigger the word, the more frequently it was used.



Questions in Ask section

The chart below shows an analysis of questions students sent to the engineers. Questions are coded into overarching categories. The examples are coloured by category.



- How big are data centres?
- What's the most recent significant advance in fusion reactor research/building?
- How do people use maths in everyday life?
- What could I do outside school that would help me learn useful skills if I want to be an engineer?
- What is your favourite place you have travelled to for your job?
- What type of data do you tell the government?
- Did you enjoy building Lego as a kid?
- Do you like Doctor Who?

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Good engagement

Information on the scientists careers can provide insight into how variable careers can be and what students may need to do to get there.

Student 1: What qualifications did you have to do to get where you are now?

Amber (engineer): I did A-Levels (Electronics, French, Chemistry, Maths) and AS Spanish. I went onto do a bachelors degree in Electrical Engineering

Taiwo (engineer): Many of the people I work with took various paths to reach this stage. Some went to college and uni, others went into apprenticeships straight from secondary school. All have had to gain experience and complete other courses to show they are able to do their jobs safely and very well. Many employers prioritise relevant experience over a degree.

Steve (engineer): If you want to be an engineer - you need to love problem solving. Although you can go down the route of starting out as an apprenticeship - eventually you'll need qualifications too. I have an HND and an Honours Degree and I'm looking at taking a PhD

Student 1: I want to be an electrician but I am very inspired by my grandad because he is a mechanical engineer and his wish was for one of his grandsons to become an electrician.

Jack (engineer): The good news is you can be BOTH - we have a couple of mechanical engineers who are also qualified electricians - they are incredibly useful in a data centre as they can fix air conditioners, generators and electrical problems too!

Amber (engineer): I have a background in Electrical engineering but I also do Mechanical engineering now. I've found once you have one engineering discipline you start to collect them all...like Pokemon!

Subject specific questions can help generate interest and knowledge about the scientific field.

Student 1: What causes circuits to heat up?

Amber (engineer): Excellent question! Sometimes incorrect connections, malfunctioning components and even occasionally animals getting into places where they shouldn't

Student 1: What is a data centre?

Emma (engineer): It's a safe place where all our digital data is stored and processed. Stuff on your phone like photos in a data centre - if you smash your phone, you still have the photos.

Jeico (engineer): A data centre is basically a big building that stores a huge amount of machines for customers.

Student 1: Oh thanks

Being able to see how science is relevant to everyday life and how certain knowledge or science can be utilised is an important part of Science Capital.

Student 1: How in engineering would you like to make the world a better place, with less greenhouse gases being emitted into the air?

Jack (engineer): Technology is at the forefront of reducing carbon emissions and certain sectors like the data centre industry are pledging to work towards net zero emission by 2030

Steve (engineer): ENgineering is about problem solving and making something as efficient and effective as possible but unfortunately not everyone uses that equipment in the ebay way and this undoes all that good work. I help them understand the impact of bad practices on their pocket and the environment: win-win!

Student 1: What do you think of using drones to deliver?

Amber (engineer): *I think it's a great idea, and maybe one day it will come into play. Some sites do use drones to check equipment and roofs and to scare away pigeons.*

Student 1: That's so cool

Connecting with scientists over shared interest and learning that they are “regular people” can help students relate to them. This makes it easier for students to see themselves in science-related careers.

Student 1: What's your favourite colour?

Amber (engineer): *I love Green, especially Olive/dark greens*

Steve (engineer): *Hmm, blue, then red*

Student 1: I love green too (my friend said your favourite colour is awesome)

Amber (engineer): *thank you :)*

Student 1: Nice, I like blue and red too!

Engineers of the Week

Students voted each week for their favourite engineer to be named Engineer of the Week.

The Engineers of the Week were:



Jordan Galloway, Consultant Engineer at Future-Tech



Femi Olushola, Senior Electrical Engineer at VIRTUS



Steve Wright, Executive Director and Chief Operating Officer at 4D COO

Engineer Winner

The overall winner, with the most votes at the end of the Zone was:

- **Femi Olushola**, Senior Electrical Engineer at VIRTUS

As Zone winner, they receive £500 to spend on further public outreach projects.



"Really, I would have loved to stay for more. I had a good time communicating about engineering with our eager students, budding to be tomorrow's leaders and engineers of the future. I could empathise with all your enthusiasm and did my energetic best to meet them all."

You can read their full statement at

<https://internet21.imanengineer.org.uk/2022/01/05/a-thank-you-from-your-winner-femi/>

Feedback

I have wanted to be a mechanical engineer since the age of 7, thank you for talking here as it may help me get a future career in engineering.

Student

It has been incredibly interesting

Student

I am still astonished and pleased with the level and quality of questions that were coming in. Thank you for the additional motivational days I had due to your questions; the future is so much more better with you all.

Femi (Engineer)

Thank you all so much this has been really inspiring and has opened up lots of new ideas and avenues.

Teacher

Please thank all the engineers this morning for managing to answer so many questions while we struggled with technical difficulties.

There were lots of good questions and I want to learn more about these jobs too, so I can describe them to children in future!

Teacher

I just wanted to send a message to the school to say they were brilliant. Most engaged group I've been involved with, a great range of questions and a lot of different kids asking questions too!

Taiwo (Engineer)